CITY OF HOUSTON

DEPARTMENT OF PUBLIC WORKS AND ENGINEERING

TRAFFIC AND TRANSPORTATION DIVISION

TRAFFIC SIGNAL DETAILS (02893 SERIES)

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CITY OF HOUSTON TEXAS

Mark J. Loethen 6/23/09
CITY ENGINEER DATE

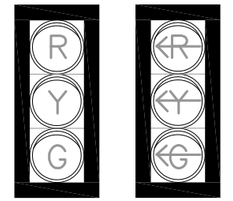
DEPUTY DIRECTOR DATE

Charles Marcotte 6/23/09
DIRECTOR DATE

DRAWING NO: 02893-01
SHEET NO.

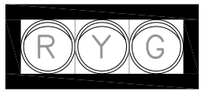
	NEW	EXISTING
TRAFFIC SIGNAL POLE	○	◌
PEDESTAL POLE	○	◌
POLE W/MAST ARM	○———	◌ — — — — — — —
VEHICLE SIGNAL HEAD	↓	▽
VEHICLE SIGNAL HEAD W/BACK PLATE	↓	▽
PEDESTRIAN SIGNAL HEAD	⊟	⊟
PEDESTRIAN PUSH BUTTON	⊓	⊓
PULL BOX – TYPE A	◇	◇
PULL BOX – TYPE B	▭	▭
PULL BOX – TYPE C	⊞	⊞
PULL BOX – TYPE B W/EXTENSION	⊠	⊠
CONDUIT	— —	— —
VIDEO DETECTION CAMERA	▭◁	▭◁
PRE–EMPT SENSOR	⚷	⚷
LUMINAIRE	⊗	⊗
LUMINAIRE W/PHOTO CELL	⊗	⊗
CONTROLLER CABINET	▮▯	▮▯
METERED POWER PEDESTAL	◈	◈
POLE MOUNTED METER	●◂	◡◁
FIBER OPTIC CONDUIT	—FO—	— FO —
MAST ARM SIGN	⊥	⊥

SIGNAL TYPES



V3

V3L



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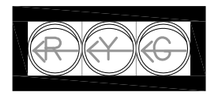
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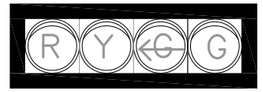

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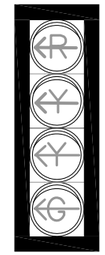
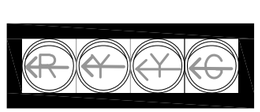

V4LF

V5R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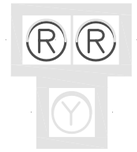
H5R



HAWK

FL–R

FL–Y


CDP

R10–3e

NOTE:

ALL VEHICULAR TRAFFIC SIGNAL HEAD TYPES HAVE 12–INCH LENSES.

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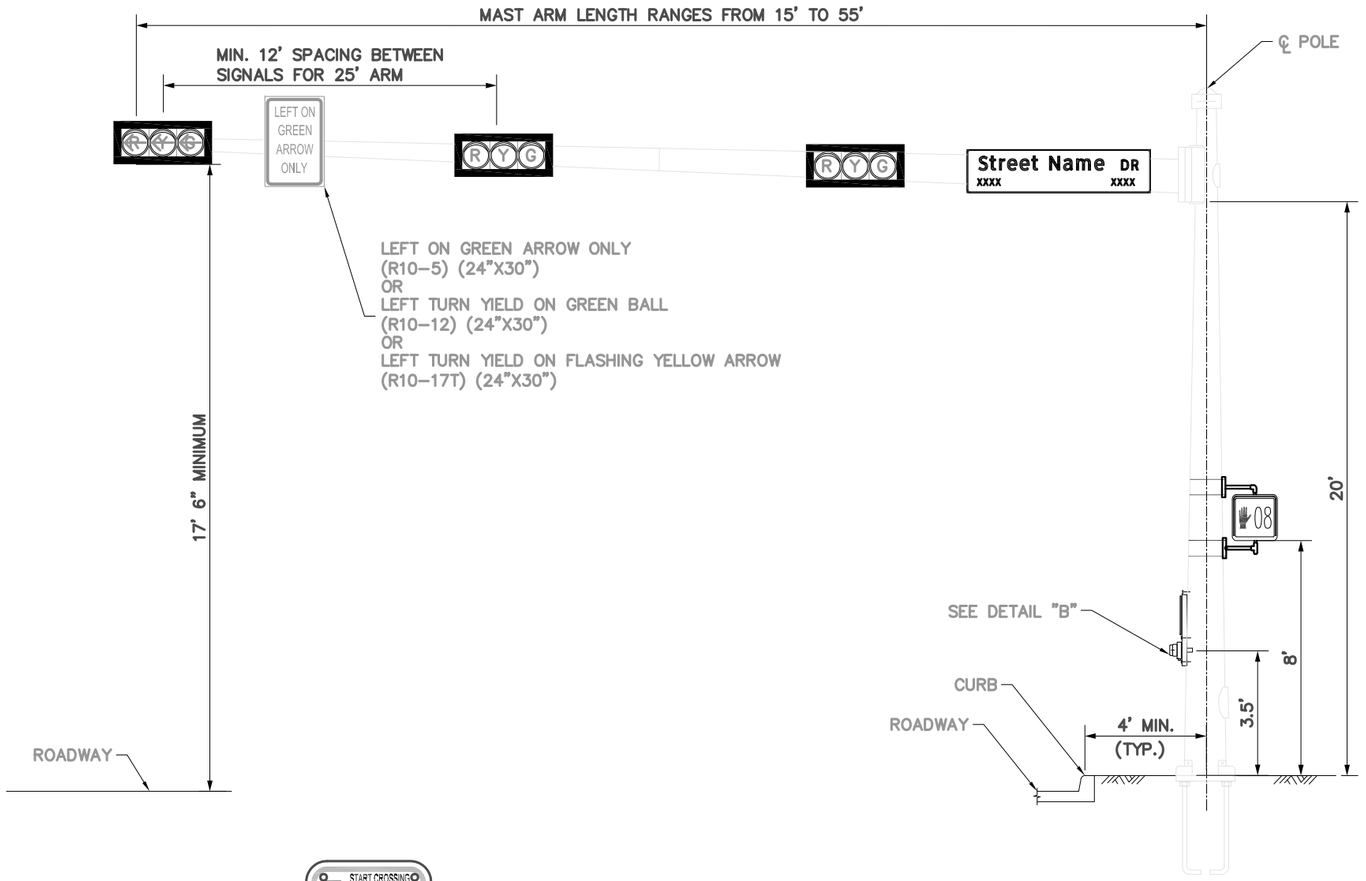
PUBLIC WORKS & ENGINEERING DEPARTMENT
TRAFFIC SIGNAL ENGINEERING
AND OPERATIONS SECTION

TRAFFIC SIGNAL DETAILS

HARDWARE LEGENDS

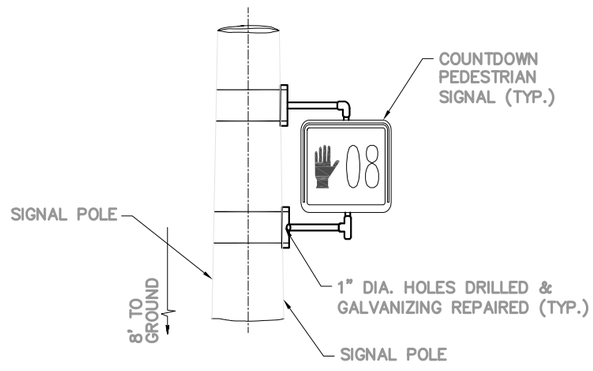
DWG. NO. 02893–02

SHEET NO.



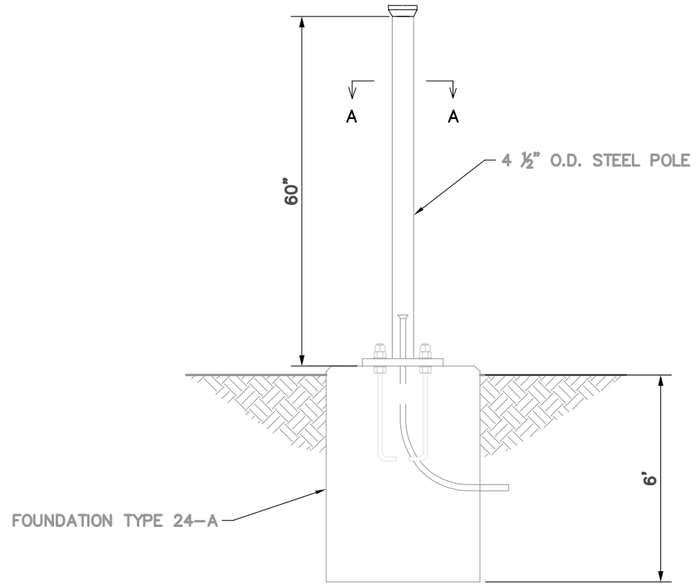
DETAIL "B"

2–WIRE POLARA NAVIGATOR PUSH BUTTON STATION WITH R10–3e SIGN

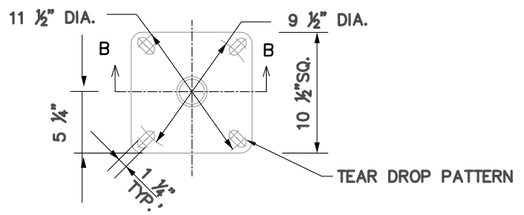


DETAIL "A"

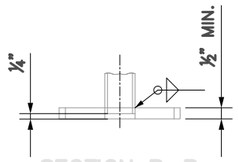
TYPICAL PEDESTRIAN SIGNAL HEAD ON TRAFFIC POLE



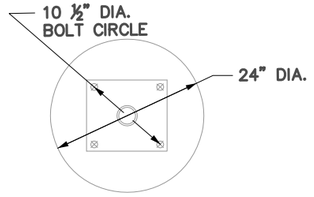
PEDESTRIAN PUSH BUTTON POLE



SECTION A–A



SECTION B–B



FOUNDATION PLAN

NOTE:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS STATED ON "PEDESTAL POLE WITH DRILLED SHAFT FOUNDATION" STANDARD.
2. REFER TO "PEDESTAL POLE WITH DRILLED SHAFT FOUNDATION" STANDARD DETAIL FOR ANCHOR BOLT DETAILS.

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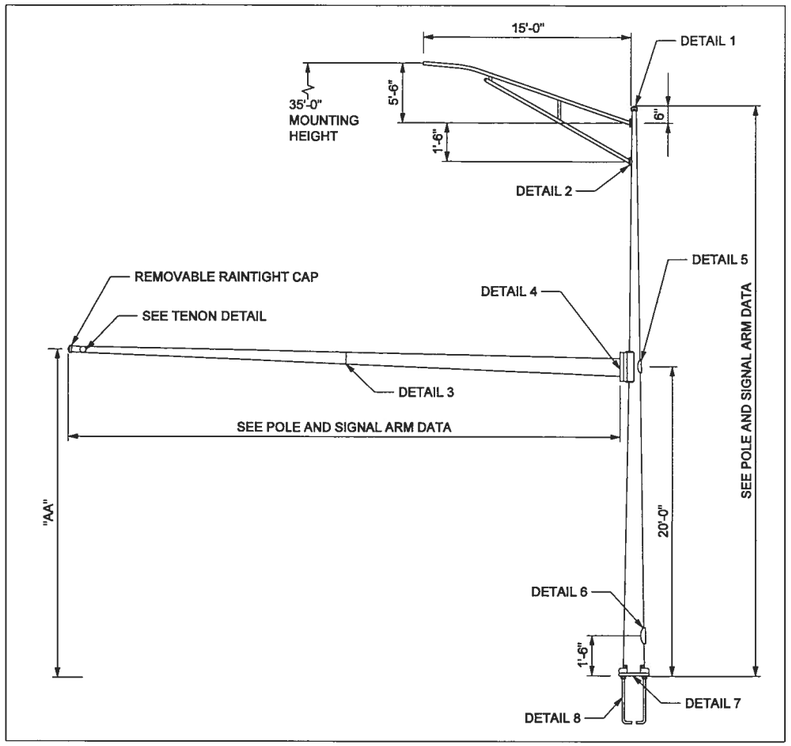
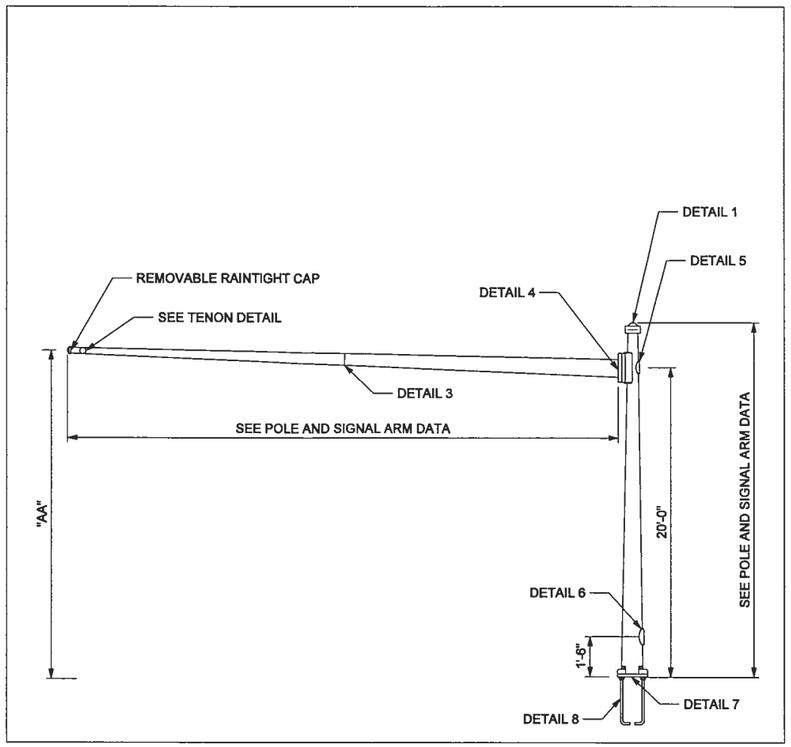
TRAFFIC SIGNAL ENGINEERING
AND OPERATIONS SECTION

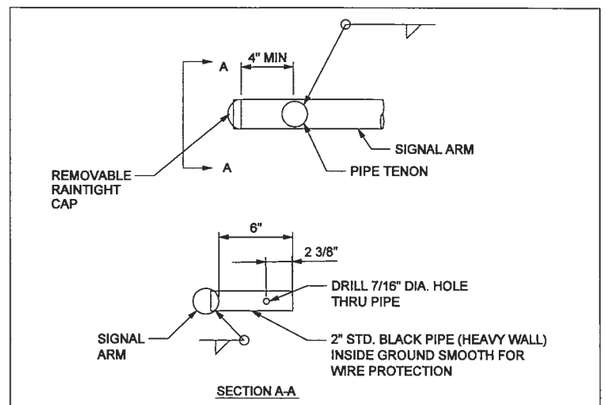
TRAFFIC SIGNAL DETAILS

TYPICAL MAST ARM / POLE FIXTURE CONFIGURATION

DWG. NO. 02893–03 | SHEET NO.





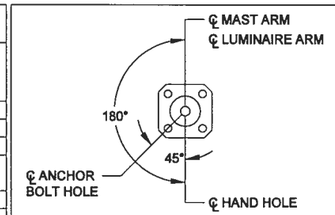


TENON DETAIL

MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
POLE SHAFT - 3 GAUGE	A595 GR.A	55	MAST ARM CONN. BOLTS	A325*	
POLE SHAFT - 0.375"	A572 GR.55	55	LUM. ARM CONN. BOLTS	SAE GR.5	36
MAST ARM SHAFT	A595 GR.A	55	ANCHOR BOLTS	F1554 GR.55	55
LUMINAIRE ARM SHAFT	2" SCH.80 PIPE		GALVANIZING	A123 & A153	
ARM ATTACHMENT PLATE	A36	36			
BASEPLATE	A36	36			

*LUBRICATE IN FIELD IF NECESSARY IN LIEU OF THE REQUIREMENTS IN A325.



RADIAL INDEX

ALTHOUGH RARE, VIBRATIONS SEVERE ENOUGH TO CAUSE DAMAGE CAN OCCASIONALLY OCCUR IN STRUCTURES OF ALL TYPES. BECAUSE THEY ARE INFLUENCED BY MANY INTERACTING VARIABLES, VIBRATIONS ARE GENERALLY UNPREDICTABLE. THE USER'S MAINTENANCE PROGRAM SHOULD INCLUDE OBSERVATION FOR EXCESSIVE VIBRATION AND EXAMINATION FOR ANY STRUCTURAL DAMAGE OR BOLT LOOSENING. ARMS SHALL BE VISUALLY INSPECTED IN 5 TO 20 MPH WIND CONDITIONS AFTER SIGNAL HEAD INSTALLATION AND, IF VERTICAL MOVEMENTS WITH A TOTAL EXCURSION (MAXIMUM POSITIVE TO MAXIMUM NEGATIVE) OF MORE THAN APPROXIMATELY 8 INCHES ARE OBSERVED AT ARM TIP, DAMPING DEVICES OR OTHER MEANS SHALL BE FITTED TO THE ARM (S). THE NECESSARY DAMPING DEVICE (S) OR OTHER REMEDIAL MEASURES SHALL BE AS RECOMMENDED BY THE CONTRACTOR. EXCESSIVE VIBRATIONS SHALL NOT BE ALLOWED TO CONTINUE FOR MORE THAN 2 DAYS.

VIBRATION DISCLAIMER

POLE AND MAST ARM DATA

DESIGNATION KEY			POLE TUBE						POLE BASE				ANCHOR BOLT				SIGNAL ARM TUBE				
POLE SERIES	POLE TYPE	SIGNAL ARM SPAN (FT)	BASE DIA. (IN)	TOP DIA. (IN) WITH LUM ARM	TOP DIA. (IN) WITHOUT LUM ARM	LENGTH (FT) WITH LUM ARM	LENGTH (FT) WITHOUT LUM ARM	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE / SLOT "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	HOOK "H" (IN)	THREAD LENGTH "U" (IN)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE OR THICK (IN)	SPAN (FT)	TIP HEIGHT "AA" (FT)
HOU	1	25	13.00	8.80	10.00	30.00	21.50	3	19.00	18.00	2.25	2.50	2.25	89.00	7.00	12.00	8.00	3.50	7	25.00	20.2
		30															9.00	4.80	7	30.00	20.3
		35															10.00	5.10	7	35.00	20.3
HOU	2	40	13.00	8.80	10.00	30.00	21.50	0.375									10.50	4.90	7	40.00	20.3
		45															10.14	3.84	3	45.00	20.4
		50															11.00	4.00	3	50.00	20.4
		55															11.50	4.16	DET 3	55.00	20.5

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AND OPERATIONS SECTION

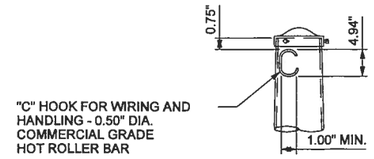
...\2009 standards\02893-04A.dgn

TRAFFIC SIGNAL STRUCTURES

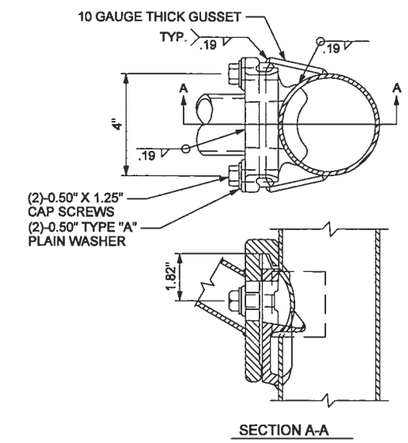
TRAFFIC SIGNAL STRUCTURES

SHEET 1 OF 2

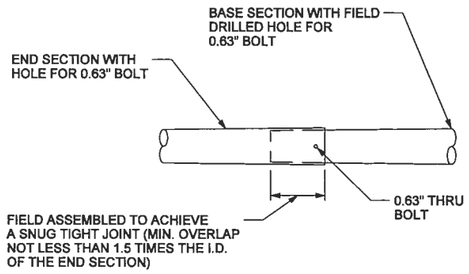
DWG. NO. 02893-04A | SHEET NO.



DETAIL 1 | POLE TOP

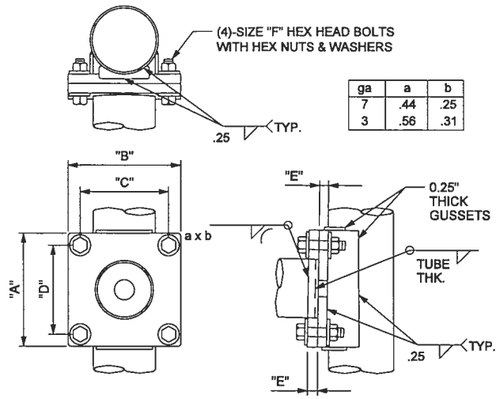


DETAIL 2 | LUMINAIRE ARM ATTACHMENT



ITEM	BASE SECTION		END SECTION	
	LENGTH	GAUGE	LENGTH	GAUGE
55.00'	26.42'	3	30.71'	7

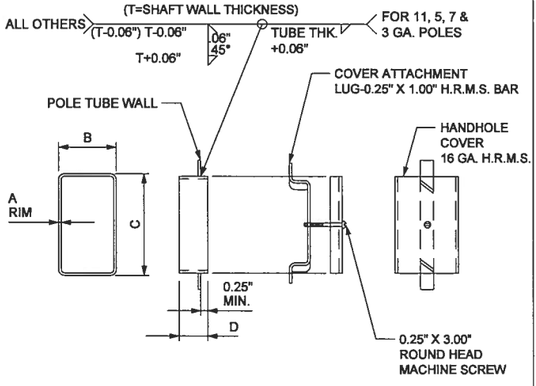
DETAIL 3 | SIGNAL ARM SLIP JOINT



ga	a	b
7	.44	.25
3	.56	.31

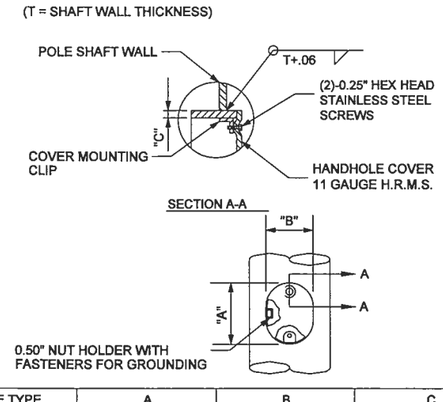
POLE TYPE	"A"	"B"	"C"	"D"	"E"	"F"
1	17.75"	17.75"	14.50"	14.50"	1.50"	1.25" X 4.50"
2	18.75"	18.75"	15.00"	15.00"	1.75"	1.50" X 5.25"

DETAIL 4 | SIGNAL ARM ATTACHMENT



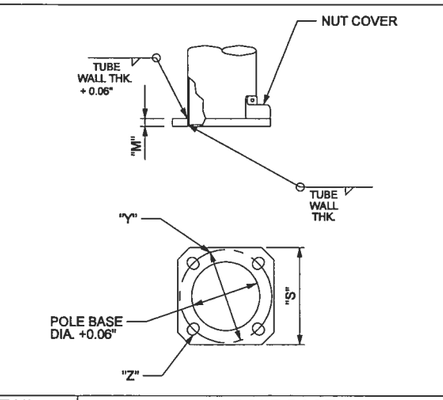
POLE TYPE	A	B	C	D
1	7 GA.	3.00"	5.00"	1.50"
2	0.50"	4.00"	6.00"	2.50"

DETAIL 5 | HANDHOLE

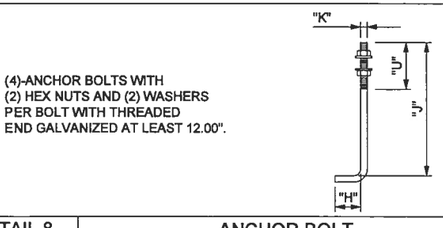


POLE TYPE	A	B	C
1	7.56"	5.19"	0.280"
2	7.31"	5.63"	0.432"

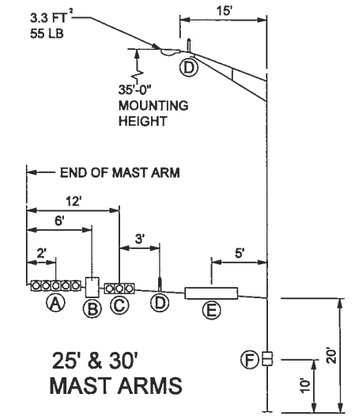
DETAIL 6 | HANDHOLE



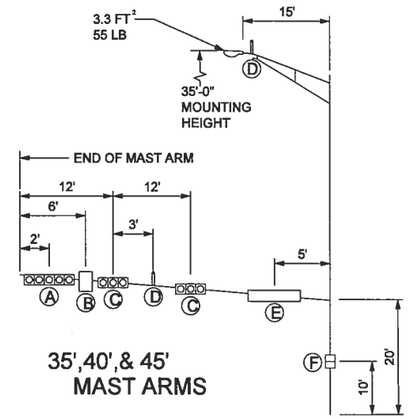
DETAIL 7 | POLE BASE



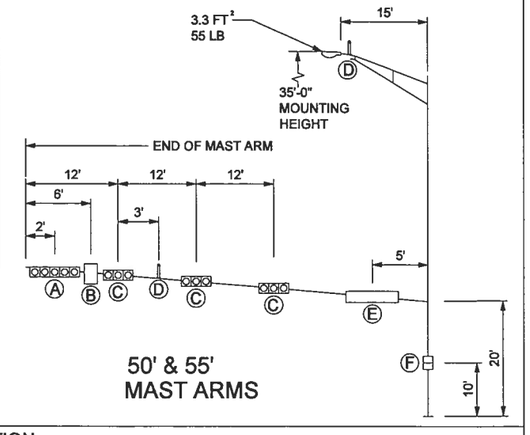
DETAIL 8 | ANCHOR BOLT



25' & 30' MAST ARMS



35',40',& 45' MAST ARMS



50' & 55' MAST ARMS

DESIGN NOTE:

DESIGNS ARE BASED ON THE LOADING CHART SHOWN ON THIS DRAWING AND ARE IN ACCORDANCE WITH MATERIALS AND ALLOWABLE STRESS REQUIREMENTS OF THE 1994 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS,LUMINAIRES AND TRAFFIC SIGNALS" FOR A 90 MPH WIND ZONE WITH A 1.3 GUST FACTOR.

DEVICE	DESCRIPTION	PROJ. AREA (FT²)	WEIGHT (LBS)
Ⓐ	12"-5 SEC. SIGNAL WITH BACKPLATES	13.33	96
Ⓑ	30" X 36" SIGNAL ARM MOUNTED SIGN	7.50	15
Ⓒ	12"-3 SEC. SIGNAL WITH BACKPLATES	8.67	53
Ⓓ	VIVDS CAMERA	1.00	15
Ⓔ	24" X 72" STREET NAME SIGN	12.00	30
Ⓕ	PEDESTRIAN SIGNAL	4.00	40

MAXIMUM LOADING INFORMATION

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PUBLIC WORKS & ENGINEERING DEPARTMENT
TRAFFIC SIGNAL ENGINEERING
AND OPERATIONS SECTION

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TRAFFIC SIGNAL STRUCTURES

TRAFFIC SIGNAL STRUCTURES

SHEET 2 OF 2

DWG. NO. 02893-04B | SHEET NO.

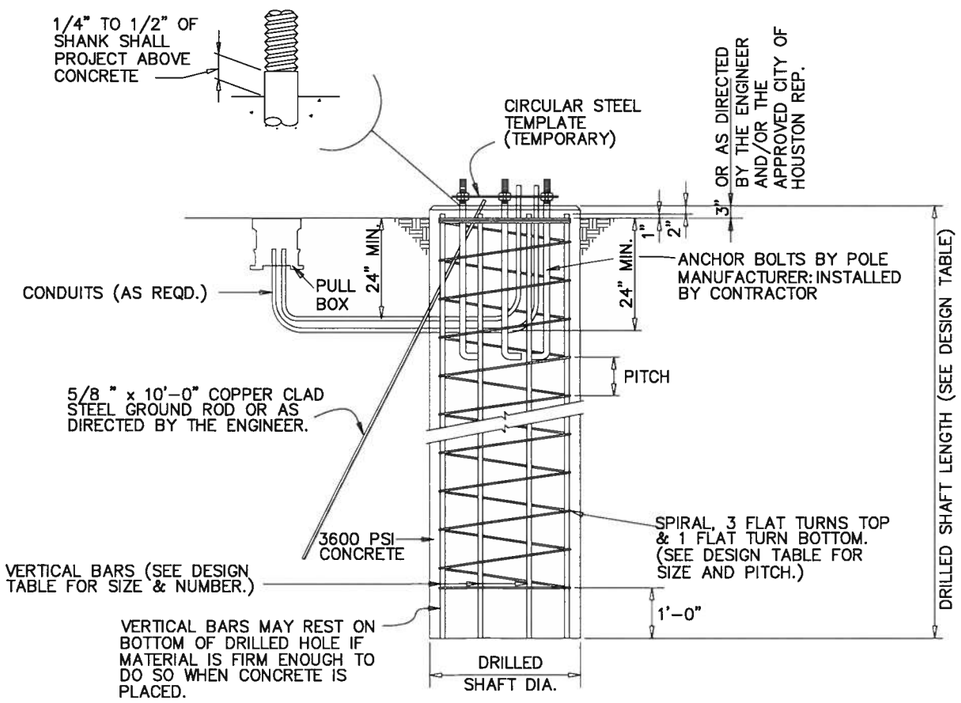
FOUNDATION DESIGN TABLE									
POLE MARK	DRILLED SHAFT DIA.	REINFORCING STEEL		DRILLED SHAFT LENGTH –feet	BOLT CIRCLE DIA.	FOUNDATION DESIGN LOADS (1)			TYPICAL APPLICATION
		VERT. BARS	SPIRAL & PITCH			MOMENT K–ft.	SHEAR KIPS	TORQUE K–ft.	
HOU 1	30"	8–#9	#3 @ 9"	14'–0"	18"	72.2	3.4	51.9	MAST ARM ASSEMBLY (25'–35') IN COHESIVE SOILS
HOU 2	30"	8–#9	#3 @ 9"	18'–0"	18"	89.9	4.0	98.0	MAST ARM ASSEMBLY (40'–55') IN COHESIVE SOILS MAST ARM ASSEMBLY (25'–55') IN NON–COHESIVE SOILS

FOUNDATION DESIGN TABLE NOTES:

(1) FOUNDATION DESIGN LOADS ARE THE ALLOWABLE MOMENTS, SHEARS AND TORQUES AT THE TOP OF THE FOUNDATION.

(2) CONSTRUCT IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATION SECTION 02465, "DRILLED SHAFT FOUNDATIONS".

(3) FOUNDATION DESIGN IS BASED UPON AN UNDRAINED SHEAR STRENGTH OF 1500 PSF FOR COHESIVE SOILS AND A TEXAS CONE PENETROMETER MINIMUM OF 10 BLOWS/FOOT IN NON–COHESIVE SOILS. WHERE COHESIVE AND NON–COHESIVE LAYERS EXIST WITHIN THE SPECIFIED SHAFT LENGTH, THE NON–COHESIVE SOILS SHALL GOVERN. LOWER SOIL PARAMETERS WILL REQUIRE A SPECIAL DESIGN.



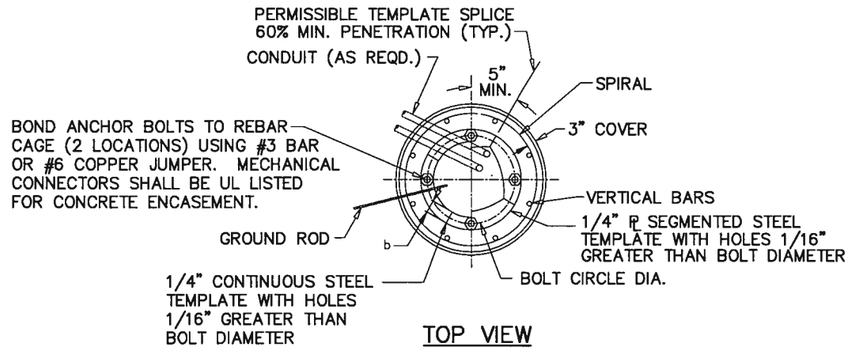
FOUNDATION DETAILS

GENERAL NOTES:

1. DESIGN IS FOR CITY OF HOUSTON STANDARD TRAFFIC SIGNAL MAST ARM SUPPORT STRUCTURES BY VALMONT INDUSTRIES, INC.
2. DESIGN CONFORMS TO 2001 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" AND INTERIM REVISIONS THERETO FOR A 90 MPH WIND ZONE WITH A 1.3 GUST FACTOR AND ACI "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318–02)".
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
4. CONCRETE SHALL BE 6 SACK, 3600 PSI.
5. ALL ANCHOR BOLTS SHALL BE GALVANIZED THE ENTIRE LENGTH OF BOLT. EXPOSED NUTS AND WASHERS SHALL ALSO BE GALVANIZED.

INSTALLATION PROCEDURE

THREADS OF ANCHOR BOLTS SHALL BE COATED WITH PIPE JOINT COMPOUND PRIOR TO INSTALLATION OF UPPER NUTS WHEN ERECTING POLE. AFTER POLE IS PLUMBED AND IN PERMANENT ALIGNMENT, THE EXPOSED THREADS OF PAINTED BOLTS SHALL BE CLEANED AND AN ADDITIONAL COATING OF ZINC–RICH PAINT APPLIED TO SEAL THE BOLT THREAD–NUT JOINT.



TOP VIEW

NOTE:

1. b = MINIMUM STEEL TEMPLATE WIDTH EQUAL TO TWO TIMES ANCHOR BOLT DIAMETER.
2. STEEL TEMPLATE MAY BE OF CONTINUOUS WIDTH OR SEGMENTED WIDTH.
3. SEE FOUNDATION DESIGN TABLE FOR BOLT CIRCLE DIAMETER.
4. BOLTS SHOULD BE CHECKED FOR PLUMB AFTER CONCRETE IS POURED AND BEFORE INITIAL SET.

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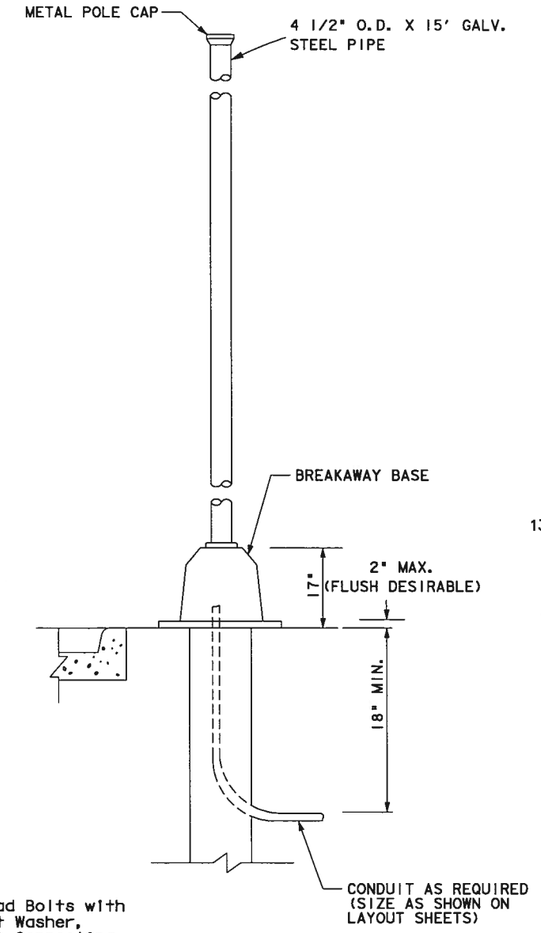
TRAFFIC SIGNAL DETAILS

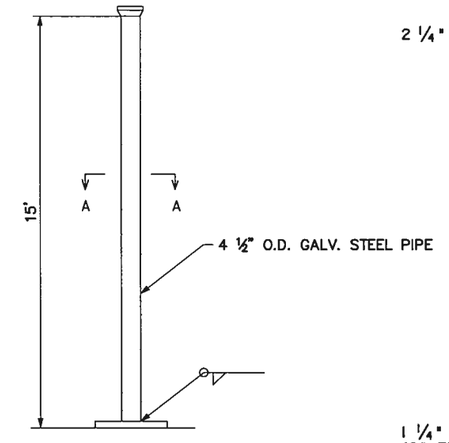
POLE FOUNDATION DETAILS

DWG. NO. 02893–05 | SHEET NO.

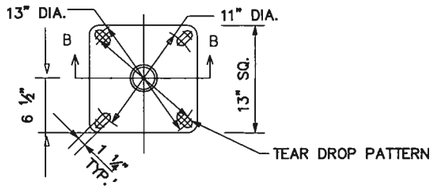
NOTES:

1. DETAILS DEPICTED ON THIS SHEET SHOW A TYPICAL PEDESTAL POLE ASSEMBLY WITH SCREW-IN ANCHOR FOUNDATION TO BE UTILIZED FOR SCHOOL ZONE FLASHERS ONLY.
2. THE PEDESTAL POLE ASSEMBLY DEPICTED ON THIS SHEET IS DESIGNED FOR SIGNAL HEADS WHERE ELECTRICAL POWER IS NEEDED WITH A BREAKAWAY POLE.
3. PROVIDE BREAKAWAY FUSE HOLDER WITH DOUBLE-POLE HOUSING. ENSURE FUSE HOLDER IS POLARIZED, WATER-RESISTANT, UL RECOGNIZED, AND RATED FOR 30A MAXIMUM CURRENT CAPACITY AT 600V OR LESS. PROVIDE BREAKAWAY FUSE HOLDER FROM MANUFACTURERS PRE-QUALIFIED BY THE TRAFFIC OPERATIONS DIVISION. SEE HTTP://WWW.DOT.STATE.TX.US/BUSINESS/PRODUCER LIST.HTM FOR LIST OF PRE-QUALIFIED MANUFACTURERS. CATEGORY IS "ROADWAY ILLUMINATION AND ELECTRICAL SUPPLIES." PROVIDE 10 AMP TIME DELAY FUSES.
4. UNLESS OTHERWISE SHOWN ON THE PLANS, PROVIDE POLE SHAFT AND BREAKAWAY BASE IN ACCORDANCE WITH THE REQUIREMENTS LISTED IN TEXAS DEPARTMENT OF TRANSPORTATION (TxDOT) STANDARD SPECIFICATION ITEM "PEDESTAL POLE ASSEMBLIES".
5. SEE TxDOT SPECIAL SPECIFICATION 4923 (SS 4923), "SCREW-IN TYPE ANCHOR FOUNDATIONS" FOR FURTHER REQUIREMENTS.
6. PROVIDE SIGNAL HEADS AND MOUNTING AS SHOWN ELSEWHERE ON THE PLANS.
7. CONDUIT IN FOUNDATION AND WITHIN 6 IN. OF FOUNDATION IS SUBSIDIARY TO STANDARD SPECIFICATION ITEM, "PEDESTAL POLE ASSEMBLIES".
8. POLE SHAFT SHALL BE ONE PIECE. ALUMINUM CONDUIT WILL NOT DEVELOP THE NECESSARY STRENGTH AND WILL NOT BE ALLOWED. IN HIGH WINDS, USE A POLE AND BASE COLLAR ASSEMBLY TO ADD STRENGTH AND PREVENT LOOSENING ON CONNECTION.
9. PER MANUFACTURER'S RECOMMENDATIONS, ENGAGE ALL THREADS ON THE PEDESTAL POLE BASE AND PIPE UNLESS THE PIPE IS FULLY SEATED INTO BASE.
10. PROVIDE NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTORS FOR BREAKAWAY POLES. (BUSSMANN HET, LITTELFUSE LET, FERRAZ-SHAWMUT FEBN, OR APPROVED EQUAL).

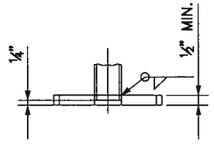




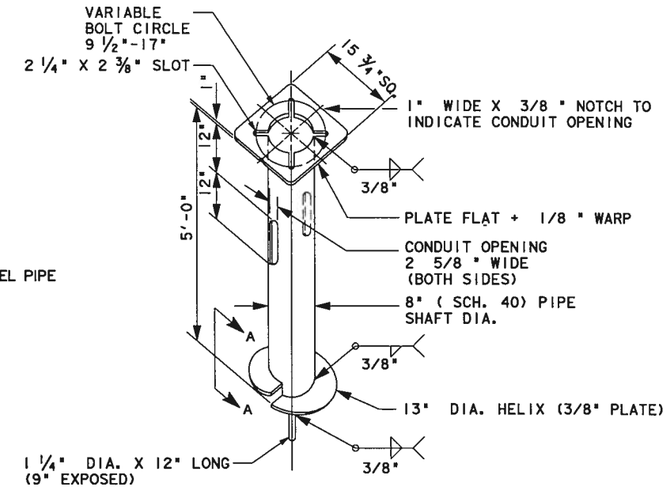
PEDESTAL POLE



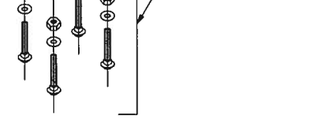
SECTION A–A



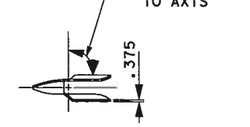
SECTION B–B



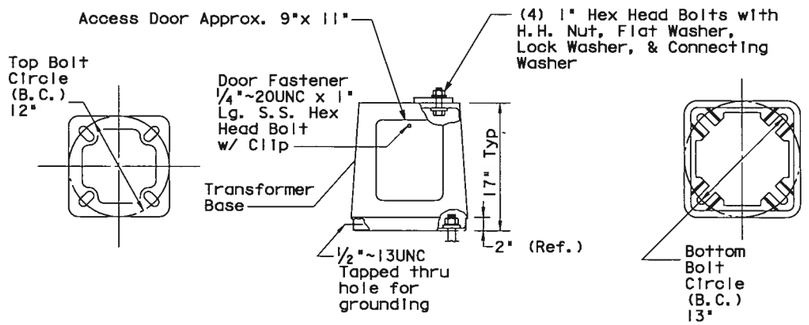
SCREW ANCHOR FOUNDATION DETAIL



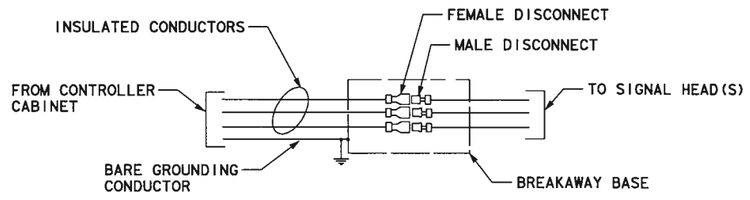
HARDWARE DETAIL



VIEW A-A



BREAKAWAY BASE DETAILS



BREAKAWAY IN-LINE FUSE HOLDERS

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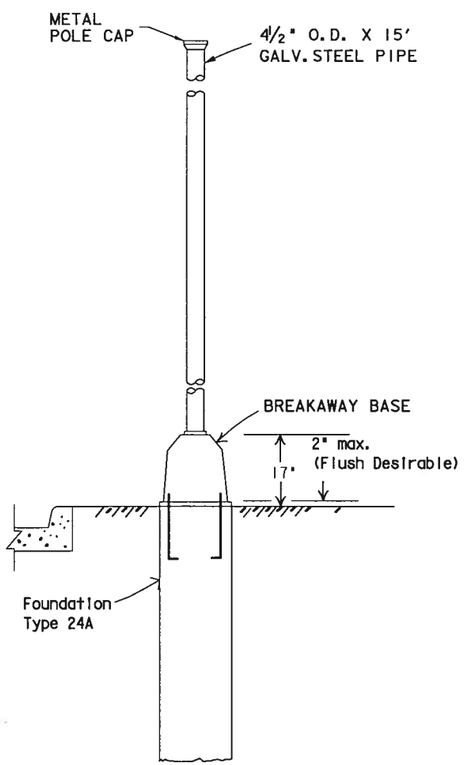
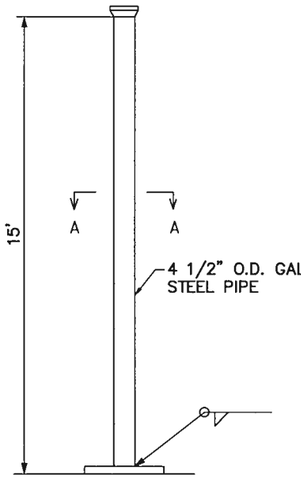
TRAFFIC SIGNAL DETAILS

PEDESTAL POLE WITH SCREW-IN ANCHOR FOUNDATION

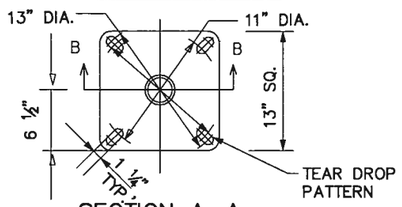
(FOR SCHOOL ZONE FLASHERS ONLY)

DWG. NO. 02893-06 | SHEET NO.

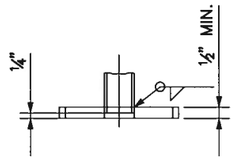




PEDESTAL POLE



SECTION A–A



SECTION B–B

NOTES:

1. DETAILS DEPICTED ON THIS SHEET SHOW A TYPICAL PEDESTAL POLE ASSEMBLY WITH A DRILLED SHAFT FOUNDATION.
2. USE 24 IN. DRILLED SHAFT FOUNDATION AS SHOWN.
3. PROVIDE BREAKAWAY FUSE HOLDER WITH DOUBLE-POLE HOUSING. ENSURE FUSE HOLDER IS POLARIZED, WATER-RESISTANT, UL RECOGNIZED, AND RATED FOR 30A MAXIMUM CURRENT CAPACITY AT 600V OR LESS. PROVIDE BREAKAWAY FUSE HOLDER FROM MANUFACTURERS PRE-QUALIFIED BY THE TRAFFIC OPERATIONS DIVISION. SEE HTTP://WWW.DOT.STATE.TX.US/BUSINESS/PRODUCER_LIST.HTM FOR LIST OF PRE-QUALIFIED MANUFACTURERS. CATEGORY IS "ROADWAY ILLUMINATION AND ELECTRICAL SUPPLIES." PROVIDE 10 AMP TIME DELAY FUSES.
4. POLE SHAFT SHALL BE ONE PIECE. ALUMINUM CONDUIT WILL NOT DEVELOP THE NECESSARY STRENGTH AND WILL NOT BE ALLOWED. IN HIGH WINDS, USE A POLE AND BASE COLLAR ASSEMBLY TO ADD STRENGTH AND PREVENT LOOSENING ON CONNECTION.
5. PER MANUFACTURER'S RECOMMENDATIONS, ENGAGE ALL THREADS ON THE PEDESTAL POLE BASE AND PIPE UNLESS THE PIPE IS FULLY SEATED INTO BASE.
6. PROVIDE NON-FUSED WATERTIGHT BREAKAWAY ELECTRICAL CONNECTORS FOR BREAKAWAY POLES. (BUSSMANN HET, LITTELFUSE LET, FERRAZ-SHAWMUT FEBN, OR APPROVED EQUAL).
7. PROVIDE SIGNAL HEADS AND MOUNTING AS SHOWN ELSEWHERE ON THE PLANS.

FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft	ANCHOR BOLT DESIGN ①				FOUNDATION DESIGN LOAD ②	
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER 10 blows/ft	ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips
24-A	24"	4-#5	#2 at 12"	6	¾"	36	*13"	1	10	1

*10 ½" B.C. FOR PUSH BUTTON POLE

NOTES:

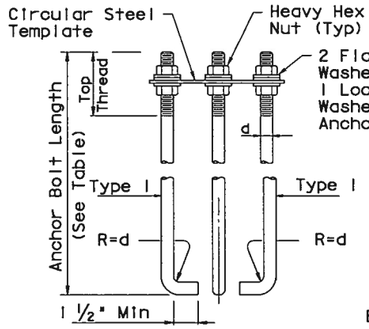
① Anchor bolt design develops the foundation capacity given under Foundation Design Loads.

② Foundation Design Loads are the allowable moments and shears at the base of the structure.

ANCHOR BOLT ASSEMBLY

INSTALLATION PROCEDURE

Threads of anchor bolts shall be coated with pipe joint compound prior to installation of upper nuts when erecting pole. After pole is plumbed and in permanent alignment, the exposed threads of painted bolts shall be cleaned and an additional coating of zinc-rich paint applied to seal the bolt thread-nut joint.



HOOKED ANCHOR (TYPE 1)

ANCHOR BOLT & TEMPLATE SIZES						
BOLT DIA IN.	③ BOLT LENGTH	TOP THREAD	BOTT THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	—	13"	7 1/8"	5 5/8"

③ Min dimensions given, longer bolts are acceptable.

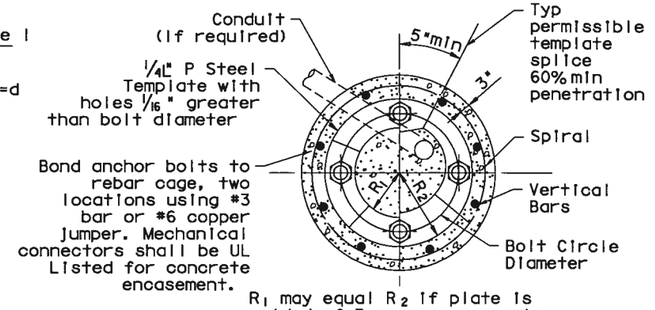
GENERAL NOTES

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.

Concrete shall be Class A or C.

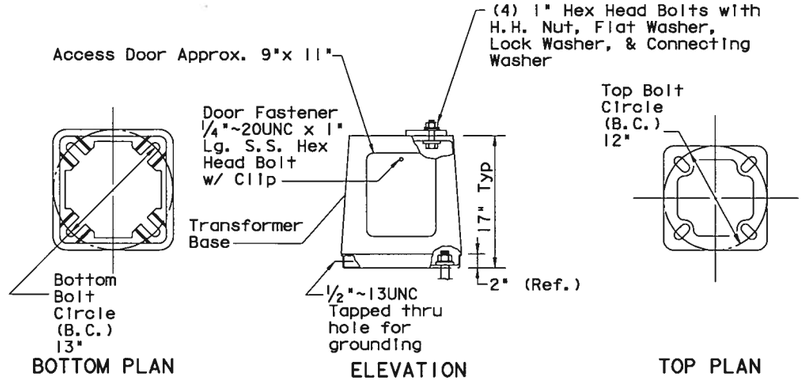
Threads for anchor bolts and nuts shall be rolled or cut threads of unified national coarse thread series except for A193B7 bolts which shall have 8 pitch thread series. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.

Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize all anchor bolts unless otherwise noted. Exposed nuts shall be galvanized or coated with zinc-rich paint. Washers shall be galvanized. Templates and embeded nuts need not be galvanized.

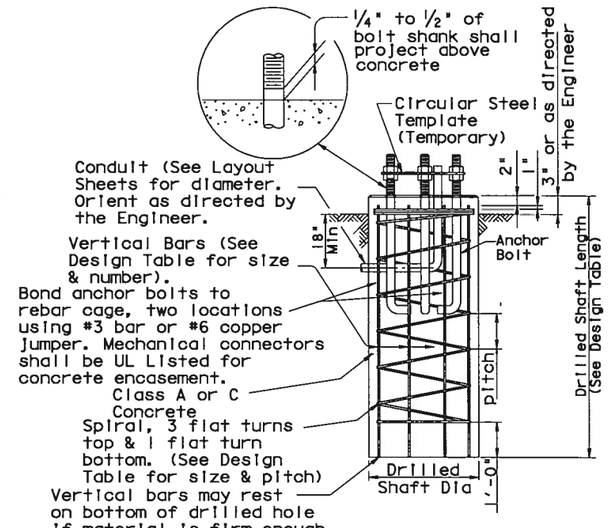


R1 may equal R2 if plate is welded of 3 or more segments.

TOP VIEW



BREAKAWAY BASE DETAILS



ELEVATION

FOUNDATION DETAILS

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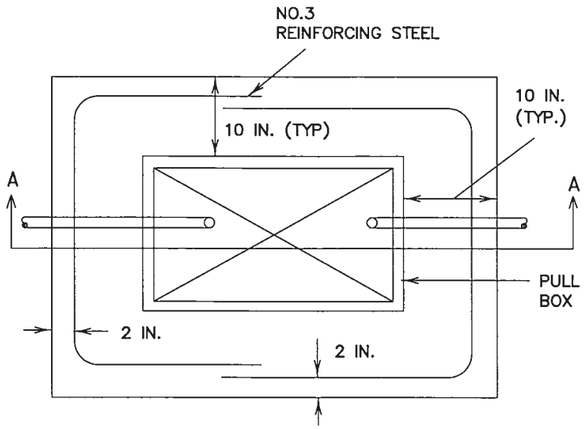
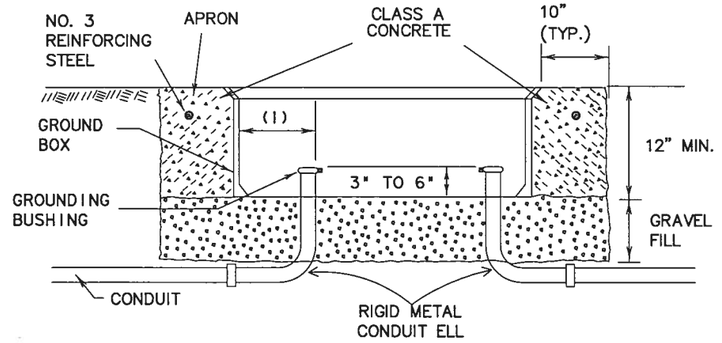
TRAFFIC SIGNAL DETAILS

PEDESTAL POLE WITH DRILLED SHAFT FOUNDATION

DWG. NO. 02893-07 | SHEET NO.



PLAN VIEW

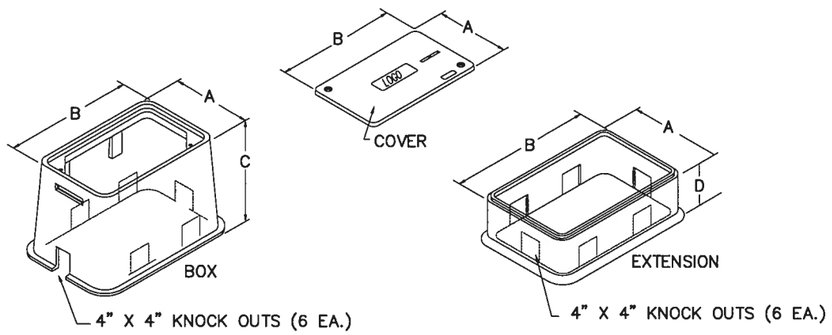


SECTION A – A

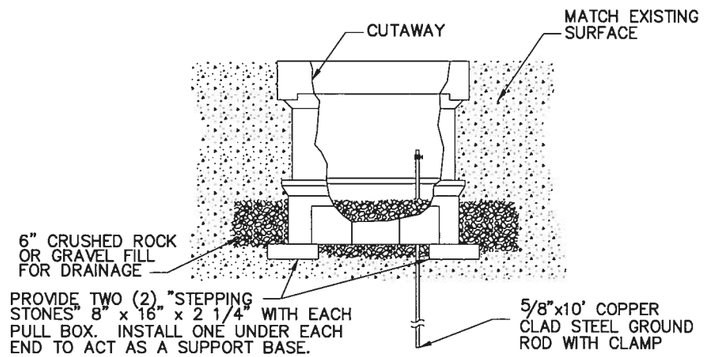
APRON FOR PULL BOXES

(PREFERRED)

(1) FINAL POSITION OF END OF CONDUIT SHALL NOT EXCEED ONE–HALF THE DISTANCE TO THE SIDE OF BOX OPPOSITE THE CONDUIT ENTRY.
(2) PLACE GRAVEL "UNDER" THE BOX, NOT "IN" THE BOX. GRAVEL SHOULD NOT ENCROACH ON THE INTERIOR VOLUME OF THE BOX.
(3) INSTALL BUSHING ON THE UPPER END OF ALL ELLS.
(4) WHERE A GROUND ROD IS PRESENT IN THE GROUND BOX, CONNECT IT TO ANY AND ALL EQUIPMENT GROUNDING CONDUCTORS USING A LISTED CONNECTOR.
(5) MAINTAIN SUFFICIENT SPACE BETWEEN ALL CONDUITS SO AS TO ALLOW FOR PROPER INSTALLATION OF BUSHINGS.
(6) ALL CONDUITS SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER.
(7) ALL CONDUITS INSTALLED IN THE GROUND BOX SHALL BE SEALED AFTER COMPLETION OF CONDUCTOR INSTALLATION AND ANY REQUIRED PULL TESTS. SILICONE SHALL NOT BE USED AS THE SEALANT.



NOMINAL DIMENSIONS FOR TRAFFIC SIGNAL PULL BOXES				
Type	A	B	C	D
DETECTOR TYPE A	13"	18"	24"	12"
TRAFFIC SIGNAL TYPE B	17"	30"	24"	12"
COMMUNICATION TYPE C	26"	38"	24"	12"



SIDE VIEW

ELECTRICAL PULL BOX ASSEMBLY

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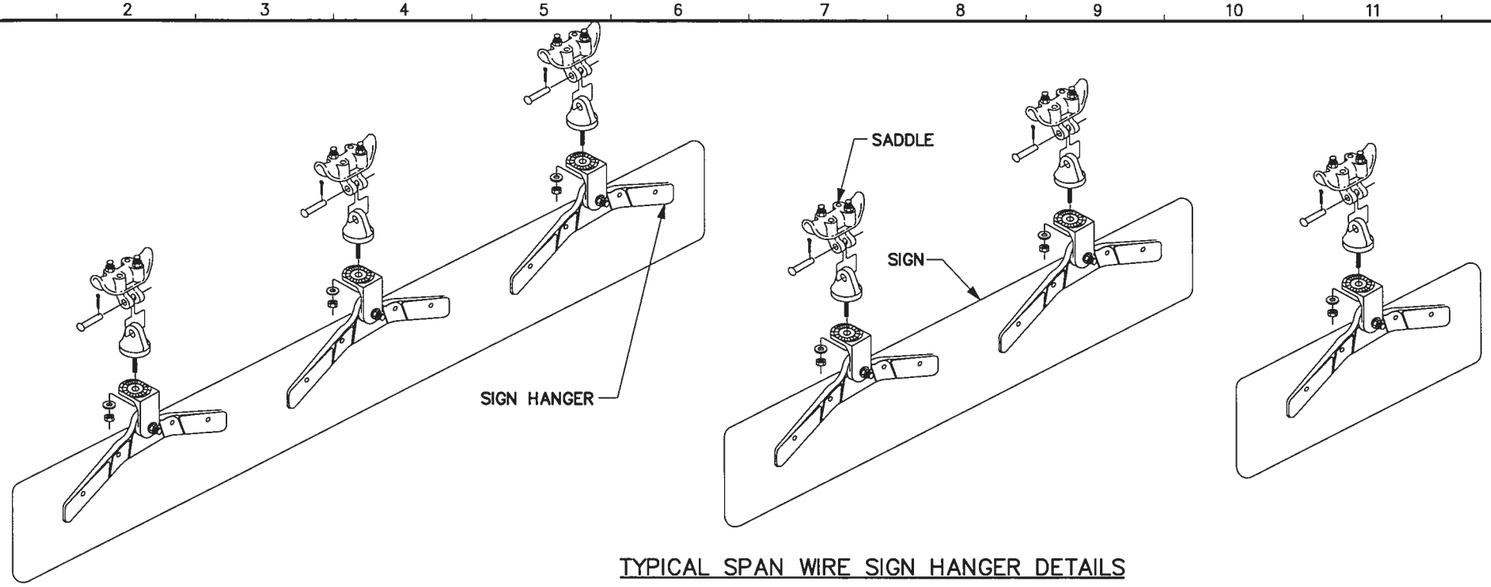
TRAFFIC SIGNAL DETAILS

PULL BOXES

DWG. NO. 02893–08 | SHEET NO.



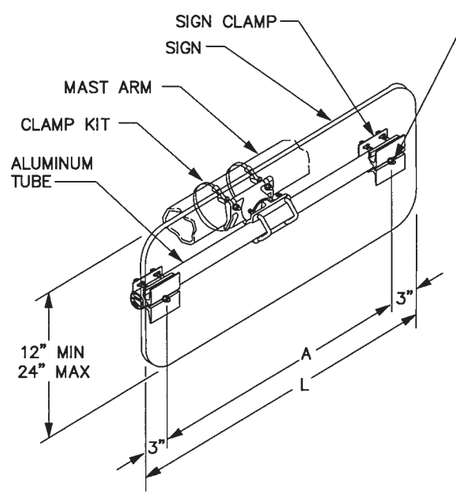
TYPICAL SPAN WIRE SIGN HANGER DETAILS

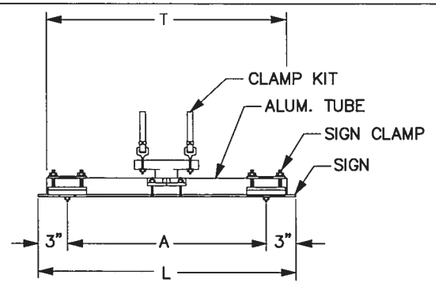
1) CONTRACTOR SHALL USE PELCO PARTS OR AN APPROVED EQUAL.

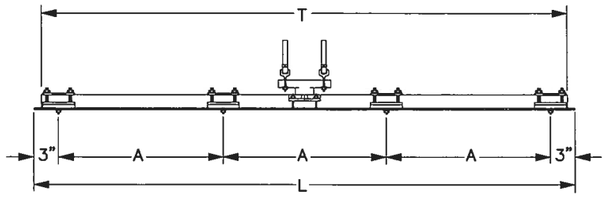
2) CONTRACTOR SHALL FURNISH ALL HARDWARE FOR A COMPLETE INSTALLATION.

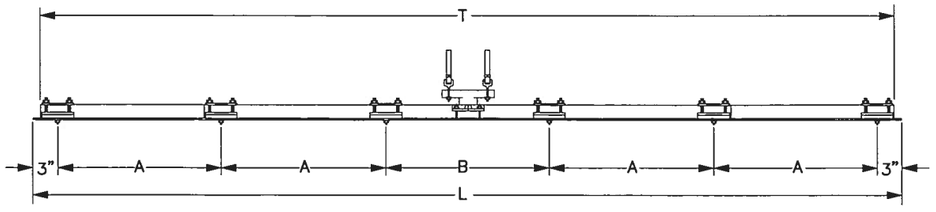
3) THE 90 DEGREE SPAN WIRE CLAMPS (SADDLES) ARE ATTACHED TO TETHERS (SWAY CABLES).

4) CONTRACTOR SHALL FURNISH ONE (1) ADJUSTABLE FREE SWINGING SIGN HANGERS PER STREET NAME SIGN SMALLER THAN 3'–0". SIGNS 3'–0" TO 6'–0" REQUIRE TWO (2) HANGERS. SIGNS LARGER THAN 6'–0" REQUIRE THREE (3) HANGERS.









TYPICAL MAST ARM SIGN MOUNT DETAILS

SIGNS (1'–6" TO 3'–0" LONG)

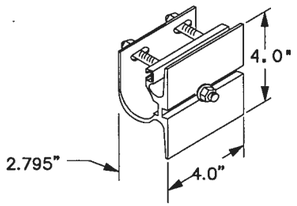
SIGN LENGTH (L)	TUBE LENGTH (T)	A
1'–6"	16"	12"
2'–0"	22"	18"
2'–6"	28"	24"
3'–0"	34"	30"

SIGNS (3'–6" TO 8'–0" LONG)

SIGN LENGTH (L)	TUBE LENGTH (T)	A
3'–6"	40"	12"
4'–0"	46"	14"
4'–6"	52"	16"
5'–0"	58"	18"
5'–6"	64"	20"
6'–0"	70"	22"
6'–6"	76"	24"
7'–0"	82"	26"
7'–6"	88"	28"
8'–0"	94"	30"

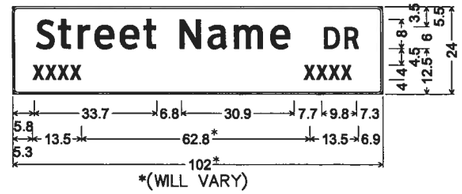
SIGNS (8'–6" TO 10'–0" LONG)

SIGN LENGTH (L)	TUBE LENGTH (T)	A	B
8'–6"	100"	19"	20"
9'–0"	106"	20"	22"
9'–6"	112"	21"	24"
10'–0"	118"	22"	26"



SIGN CLAMP DETAIL

GUSSETED TUBE CROSS SECTION



*(WILL VARY)

DIMENSIONS IN INCHES
VARIES x 24"
LETTERS – WHITE REFLECTIVE
BORDER – WHITE REFLECTIVE
BACKGROUND – GREEN REFLECTIVE
(ALL MATERIAL SHALL BE DIAMOND GRADE VIP SHEETING)

STREET NAME SIGN DETAIL

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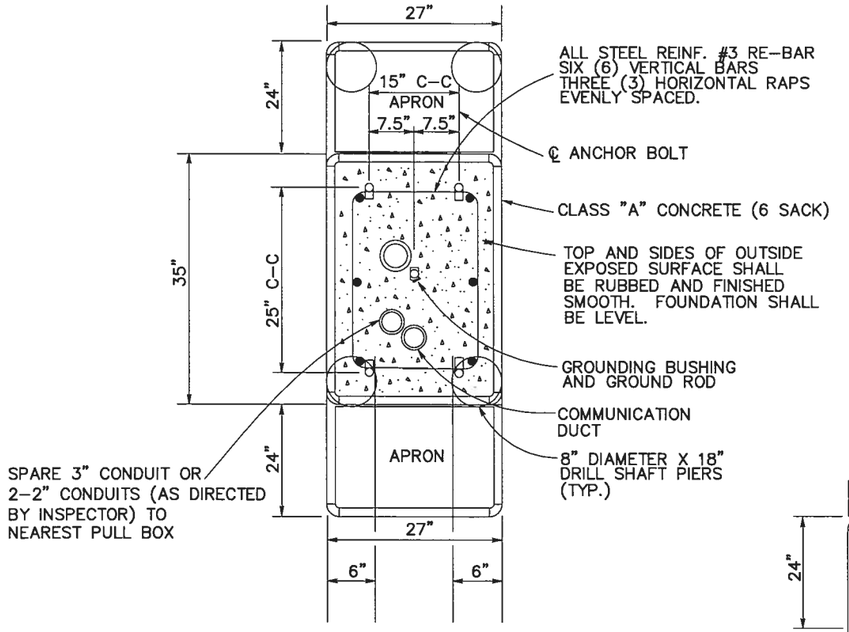
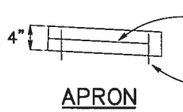
TRAFFIC SIGNAL DETAILS

OVERHEAD STREET NAME SIGN MOUNTING DETAILS

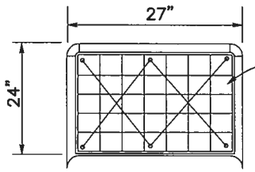
DWG. NO. 02893–09 | SHEET NO.



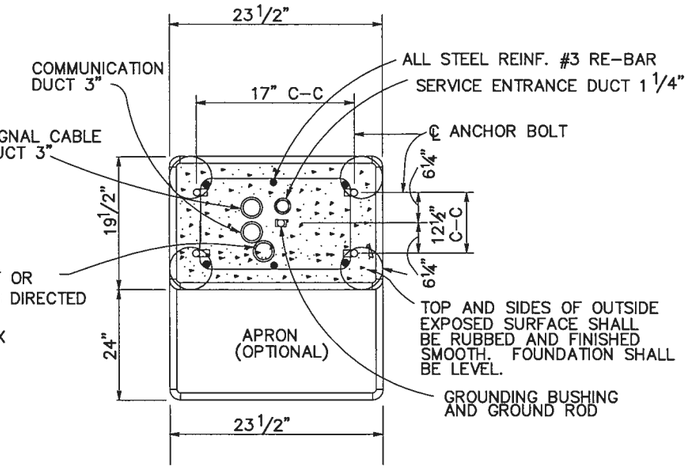
342-HOUSING 1 DETAIL
TOP VIEW



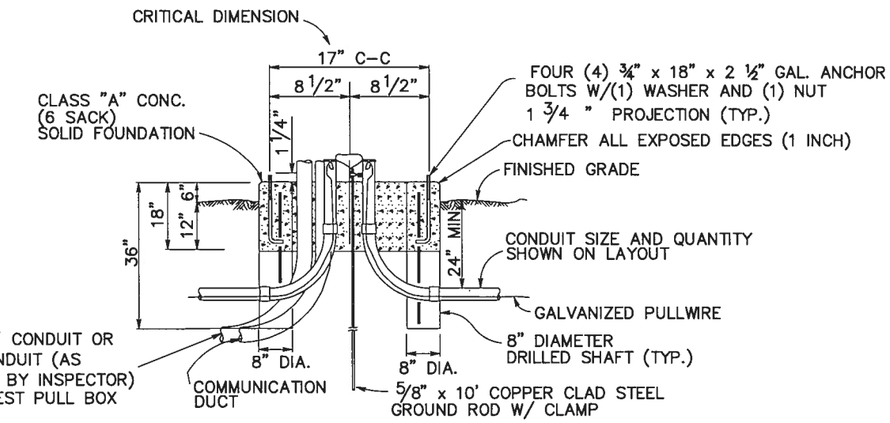
APRON
SIDE VIEW



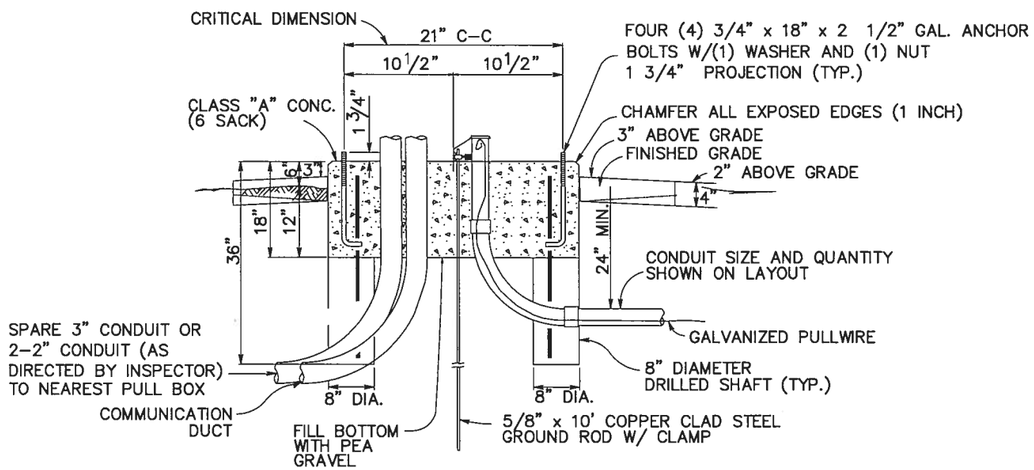
APRON DETAIL
TOP VIEW



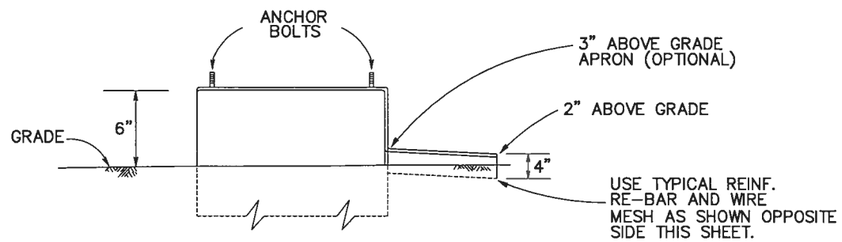
303 DETAIL



303 DETAIL
SIDE VIEW



342-HOUSING 1 DETAIL
SIDE VIEW



303 DETAIL

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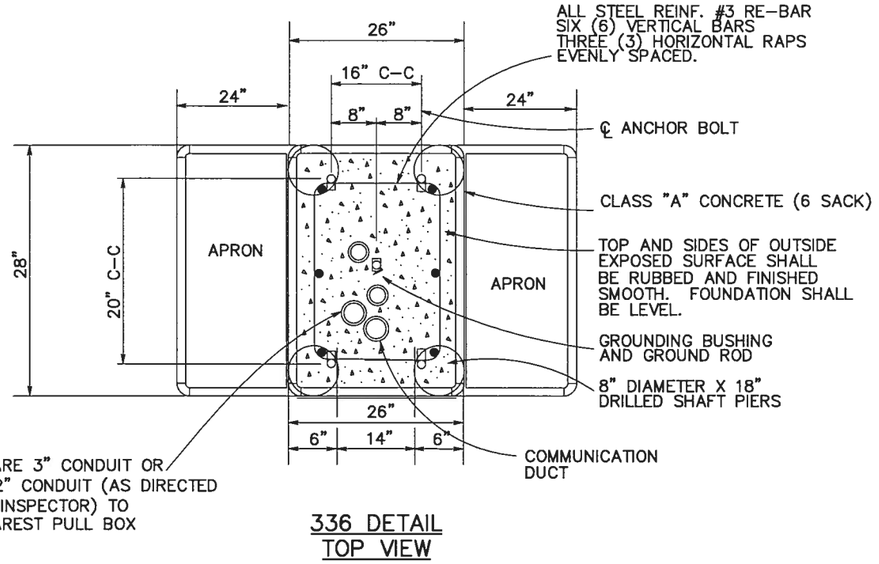
TRAFFIC SIGNAL DETAILS

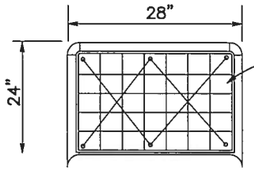
CONTROLLER FOUNDATIONS

SHEET 1 OF 3

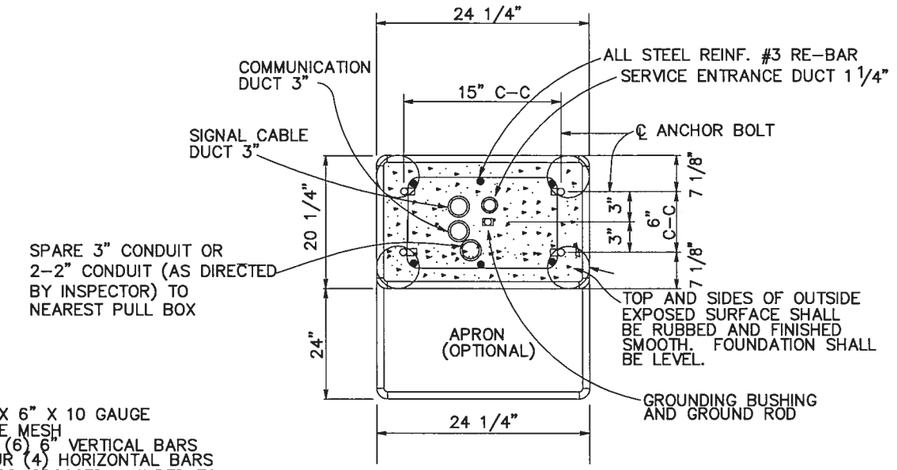
DWG. NO. 02893-10A | SHEET NO.



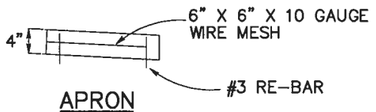
336 DETAIL
TOP VIEW



APRON DETAIL
TOP VIEW

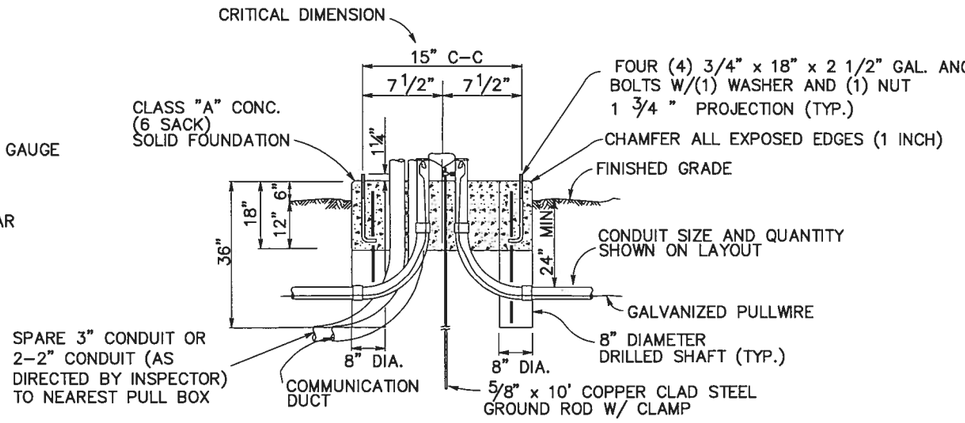


346 DETAIL

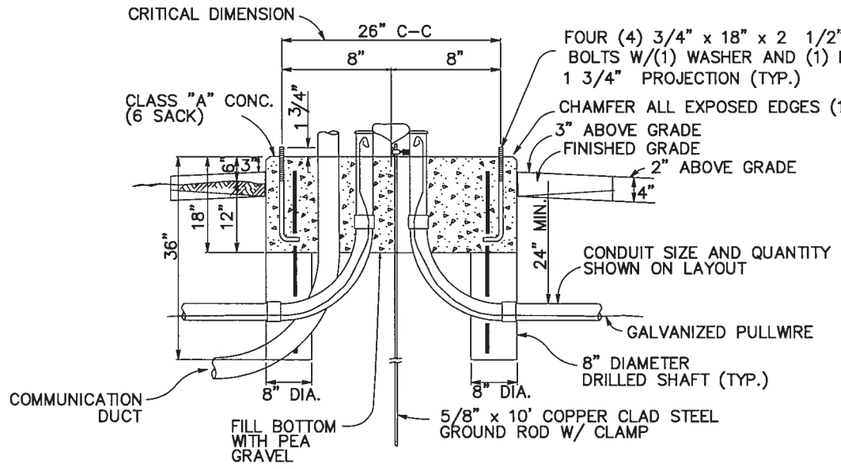


APRON
SIDE VIEW

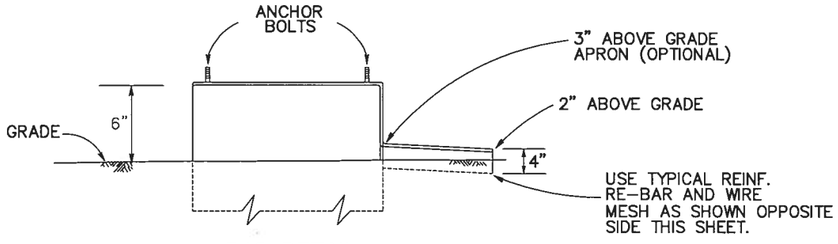
NOTE:
APRON TO BE INSTALLED IF NEEDED.



346 DETAIL
SIDE VIEW



336 DETAIL
SIDE VIEW



346 DETAIL

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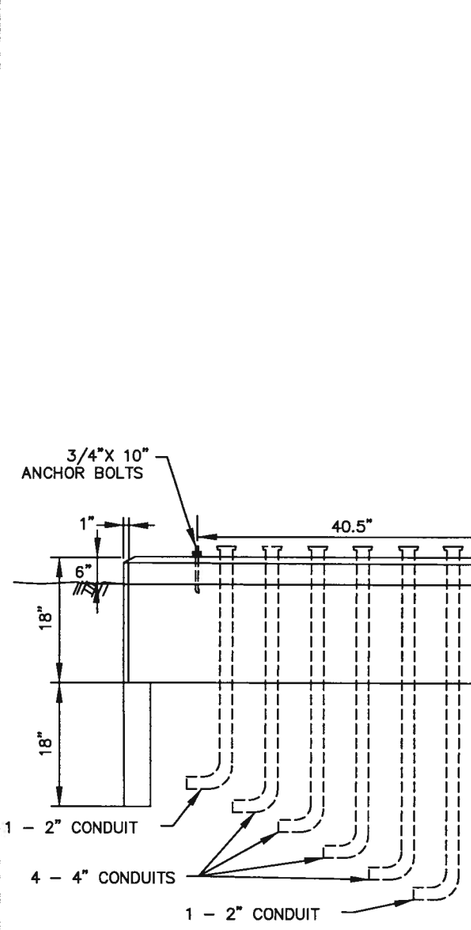
TRAFFIC SIGNAL DETAILS

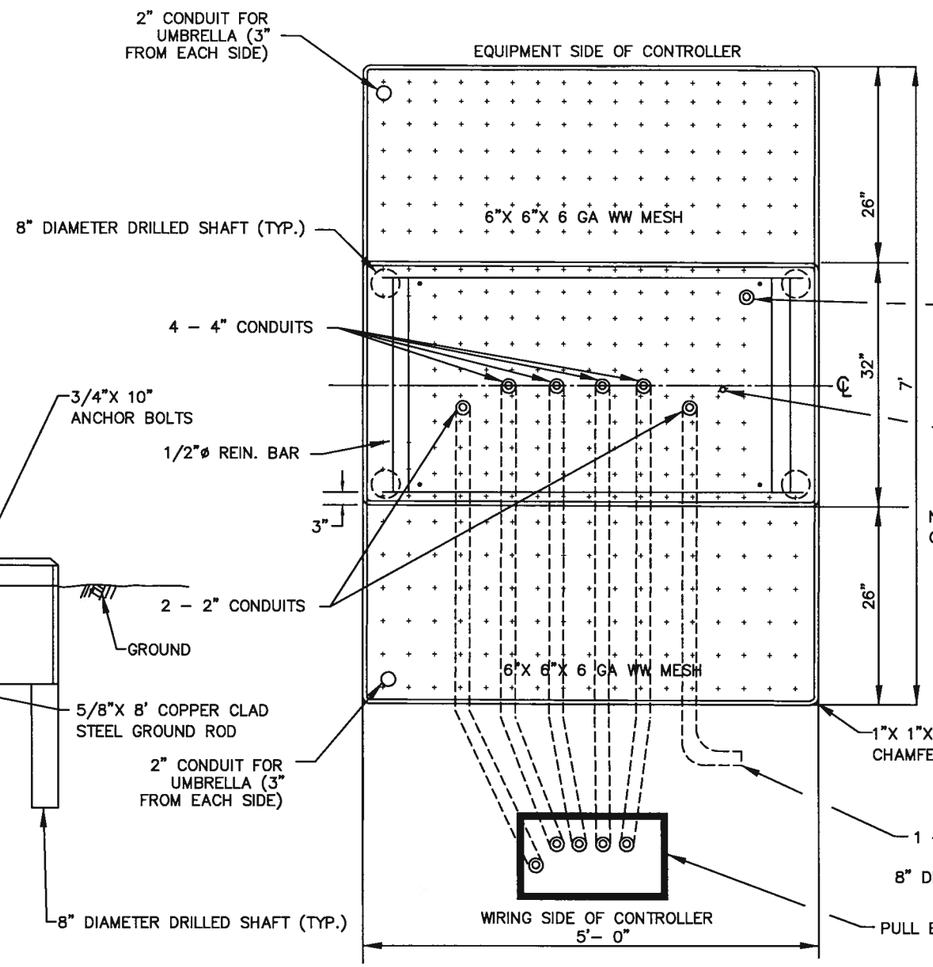
CONTROLLER FOUNDATIONS

SHEET 2 OF 3

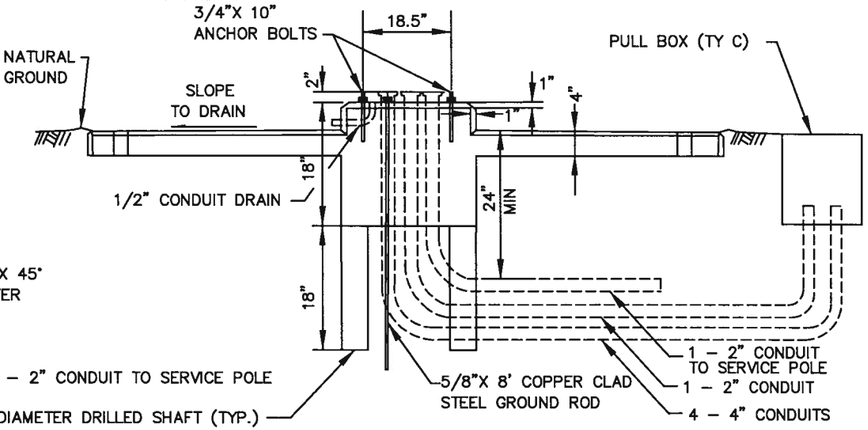
DWG. NO. 02893-10B | SHEET NO.



MODEL 340 DETAIL
FRONT VIEW



MODEL 340 DETAIL
TOP VIEW



MODEL 340 DETAIL
SIDE VIEW

CONTROLLER FOUNDATION NOTES:

1. ALL CONCRETE TO BE IN ACCORDANCE WITH CITY OF HOUSTON SPECIFICATION SECTION 03310.
2. SET THE TOP OF THE STEP OF THE CONTROLLER FOUNDATION NO LOWER THAN THE LEVEL OF THE PAVEMENT SURFACE. ANY NECESSARY ADJUSTMENT SHALL BE APPROVED BY THE ENGINEER.
3. CENTER THE CABINET ON THE FOUNDATION.
4. THE FOUNDATION SHALL BE SUPPORTED BY UNDISTURBED SOIL OR BY SOIL THAT HAS BEEN COMPACTED TO 90% PROCTOR DENSITY IN 6" LIFTS.

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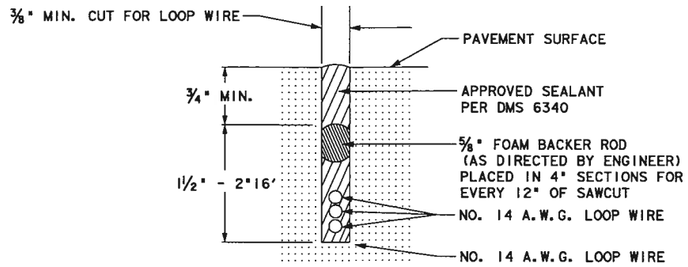
TRAFFIC SIGNAL DETAILS

CONTROLLER FOUNDATIONS

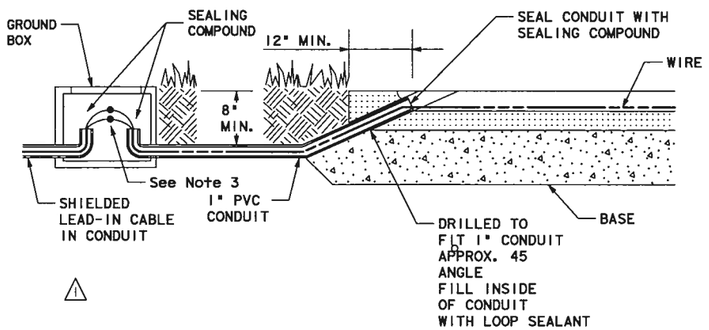
SHEET 3 OF 3

DWG. NO. 02893–10C | SHEET NO.

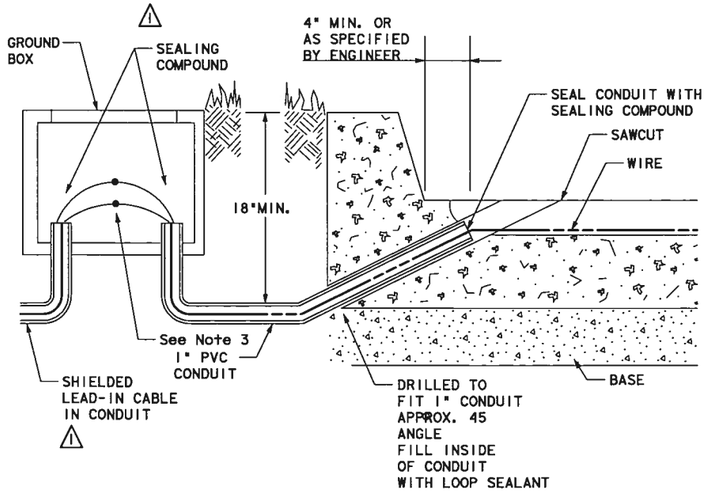


LOOP SAW CUT CROSS-SECTION

* SAWCUTS IN BRIDGE DECKS ARE TYPICALLY 1" DEPTH MAXIMUM SAWCUTS IN BRIDGE DECKS AND ACROSS EXPANSION JOINTS SHALL BE AS APPROVED BY ENGINEER



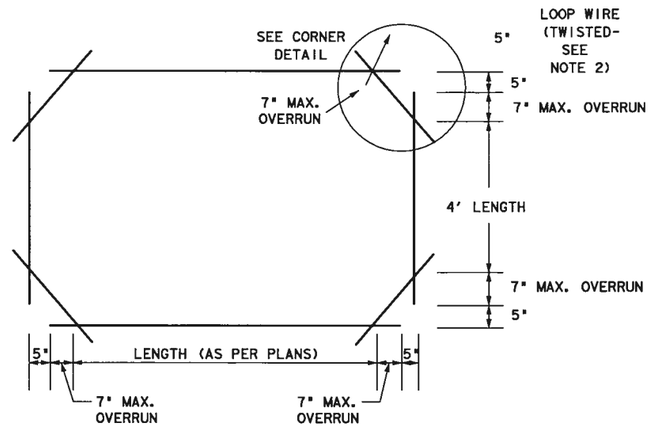
TYPICAL LEAD IN CONFIGURATION (WITHOUT CURBING)



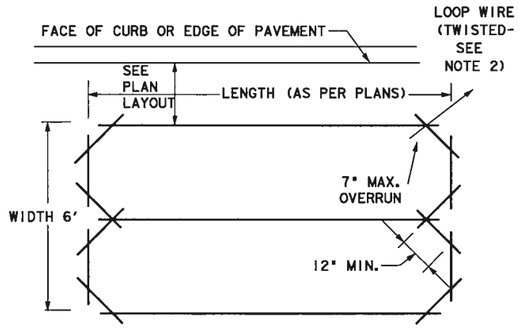
TYPICAL LEAD IN CONFIGURATION (WITH CURBING)

TYPICAL LOOP DETECTOR LAYOUT

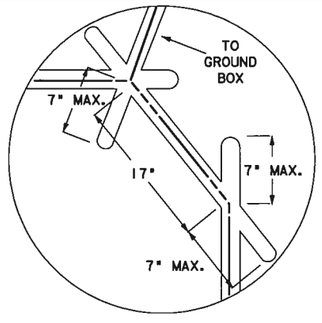
(AS SPECIFIED IN PLANS)



RECTANGULAR

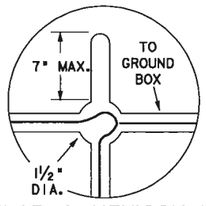


QUADRAPOLE



RECTANGULAR & HEXIGON LOOP

SAWCUT CORNER DETAIL
7" OVERRUN BASED ON
24" DIAMETER SAW BLADE



RECTANGULAR & HEXIGON LOOP (ALT.)

DRILLED CORNER DETAIL

TYPICAL CORNER DETAILS

GENERAL NOTES:

1. The pavement cut is to be made with a concrete saw to neat lines and loose material removed. The cut shall be clean and dry when the wire and sealing compound is placed.
2. Loop wire shall be 14 AWG Stranded Type XHHW. Wire from the loop to the ground box shall be twisted a minimum of 5 turns per foot. No splices shall be permitted in the loop or in the run to the ground box.
3. The home run cable from the pull box to the controller shall be IMSA 50-2 shielded cable and shall be soldered to the loop wire. The solder joints shall be sealed with Scotchcast or other method acceptable to the Engineer. The shield shall be grounded only at the controller end. Loop home run cable shall be two conductor 14 AWG shielded, Type XHHW.
4. All wire placed in the saw cut shall be sealed by fully encapsulating it in a sealant acceptable to the Engineer. Sealing compound shall be in accordance with DMS 6340.
5. The loop location, configuration and number of turns shall be as indicated on the plans or as directed by the Engineer.

Recommended Number of Turns for Loop Detectors

LOOP PERIMETER SIZE (FT.)	NUMBER OF TURNS	APPROXIMATE LOOP SIZES INCLUDED
24' or Less	3 or 4	5' x 5', 6' x 6'
25' - 110'	2 or 3	6' x 10', 6' x 45'
110' or More	1 or 2	6' x 50' or Longer

6. A separate saw cut shall be made from each loop to the edge of pavement or as specified by the Engineer.
7. Splices between the loop lead-in cable and loop detector shall be made only in the ground box near the loop it is serving.
8. Circular loops may use prewound loops encased in continuous pvc tubing. Sawcut width may be adjusted to accommodate tubing.
9. The lead-in wire in the circular loop shall be coiled at the 3 inch drilled corner to reduce bending stress.
10. Loop duct may be used as specified by Engineer.

For additionhnal information refer to "Texas Traffic Signal Detector" manual, TTI Report 1163-1.

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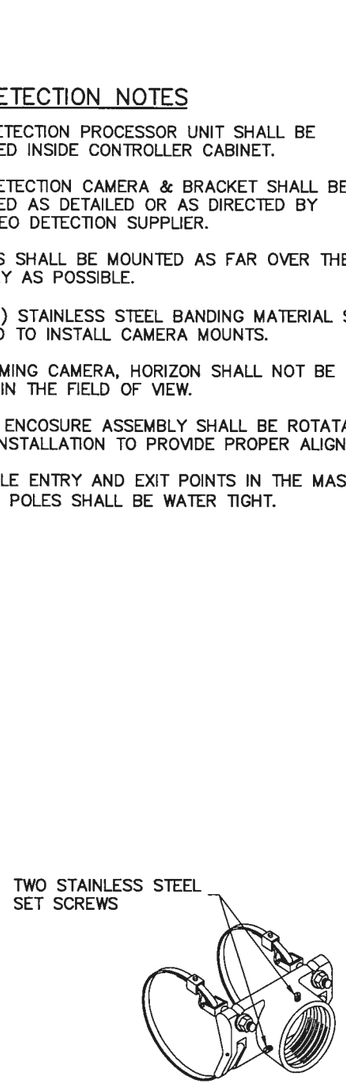
TRAFFIC SIGNAL DETAILS

LOOP DETECTOR INSTALLATION DETAILS

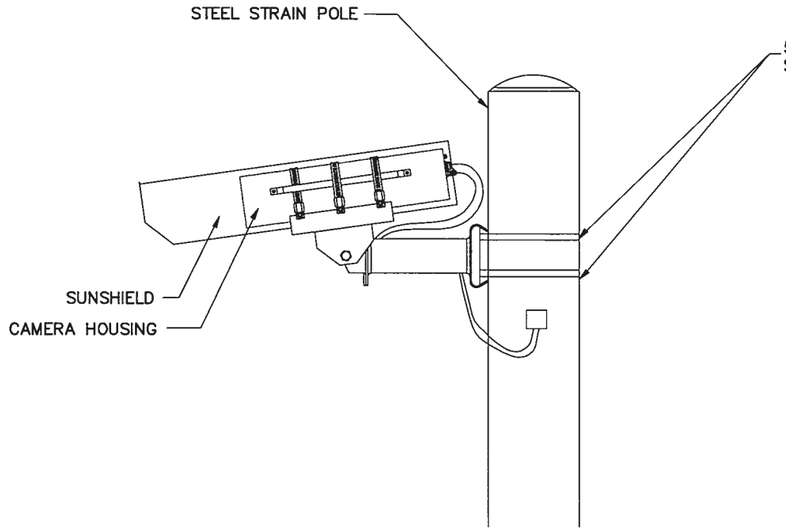
DWG. NO. 02893-11 | SHEET NO.

VIDEO DETECTION NOTES

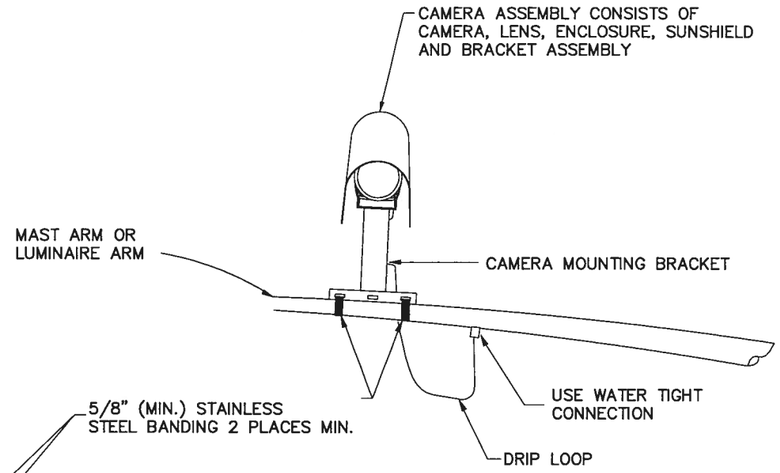
1. VIDEO DETECTION PROCESSOR UNIT SHALL BE INSTALLED INSIDE CONTROLLER CABINET.
2. VIDEO DETECTION CAMERA & BRACKET SHALL BE INSTALLED AS DETAILED OR AS DIRECTED BY THE VIDEO DETECTION SUPPLIER.
3. CAMERAS SHALL BE MOUNTED AS FAR OVER THE ROADWAY AS POSSIBLE.
4. 5/8" (MIN.) STAINLESS STEEL BANDING MATERIAL SHALL BE USED TO INSTALL CAMERA MOUNTS.
5. WHEN AIMING CAMERA, HORIZON SHALL NOT BE VISIBLE IN THE FIELD OF VIEW.
6. CAMERA ENCOSURE ASSEMBLY SHALL BE ROTATABLE AFTER INSTALLATION TO PROVIDE PROPER ALIGNMENT.
7. ALL CABLE ENTRY AND EXIT POINTS IN THE MAST ARM AND/OR POLES SHALL BE WATER TIGHT.

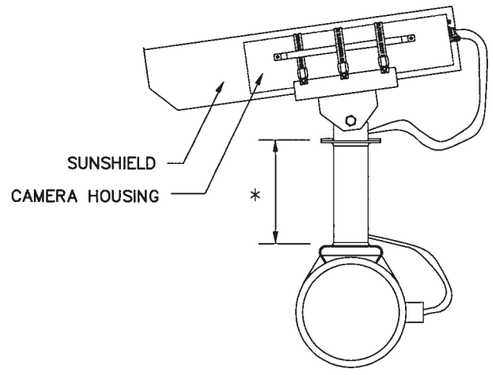


BAND MOUNT BRACKET DETAIL



POLE MOUNT





SIDE VIEW

* 4.0' PIPE EXTENSION WHEN MOUNTED ON TRAFFIC SIGNAL MAST ARM

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TRAFFIC SIGNAL DETAILS

VIDEO CAMERA MOUNTING DETAILS

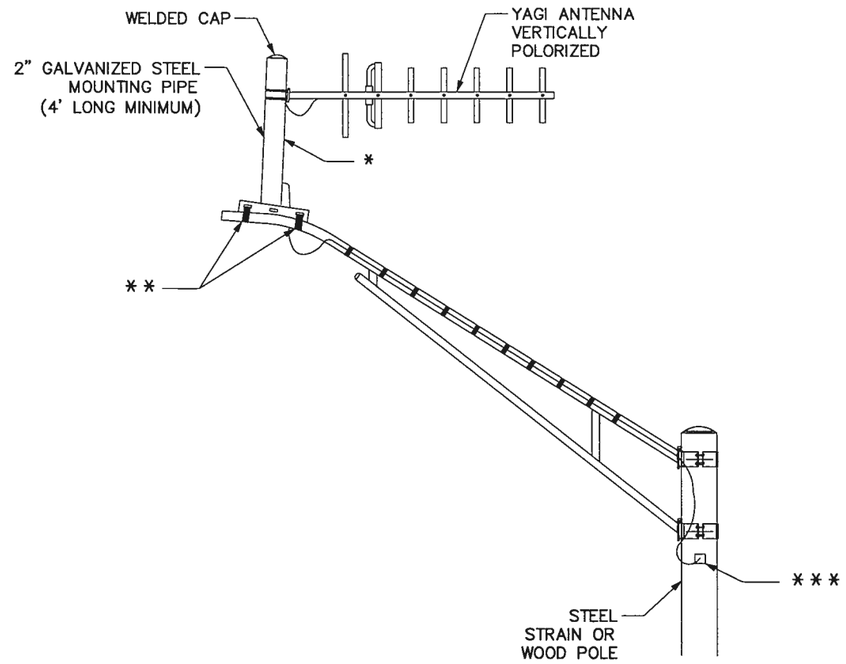
DWG. NO. 02893-12

SHEET NO.

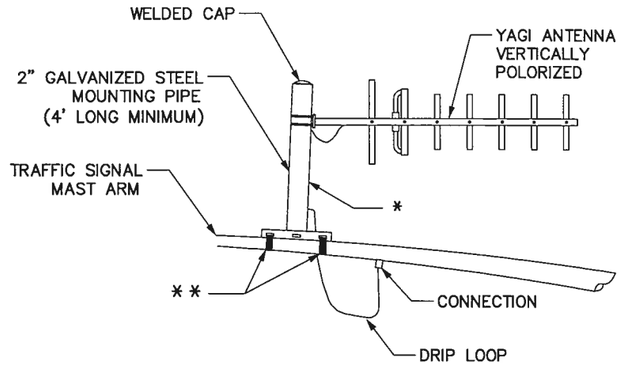
NOTES FOR SPREAD SPECTRUM ANTENNAS:

1. MOUNT ANTENNAS TO PROVIDE THE HIGHEST LEVEL OF RELIABILITY BETWEEN SENDING AND RECEIVING UNITS.
2. PERFORM A PATH STUDY TO DETERMINE EXACT MOUNTING LOCATION OF ANTENNAS BY RADIO SUPPLIER.
3. INSTALL ANTENNAS AS DETAILED OR AS DIRECTED BY THE SPREAD SPECTRUM RADIO SUPPLIER.
4. FURNISH MOUNTING BRACKETS FOR ANTENNAS ATTACHED TO VERTICAL PIPE AS RECOMMENDED BY SPREAD SPECTRUM RADIO SUPPLIER.
5. UNLESS NOTED, USE 5/8" STAINLESS STEEL BANDING MATERIAL TO INSTALL ANTENNA MOUNTS.
6. PROVIDE WATER TIGHT CABLE ENTRY AND EXIT POINTS IN THE TRAFFIC SIGNAL MAST ARM AND/OR POLES.
7. FOR SPREAD SPECTRUM COAX OR HELIAX CABLE ATTACHED TO LUMINAIRE ARM, PROVIDE UV STABILIZED TIE-WRAP THAT IS APPROVED FOR OUTDOOR USE.

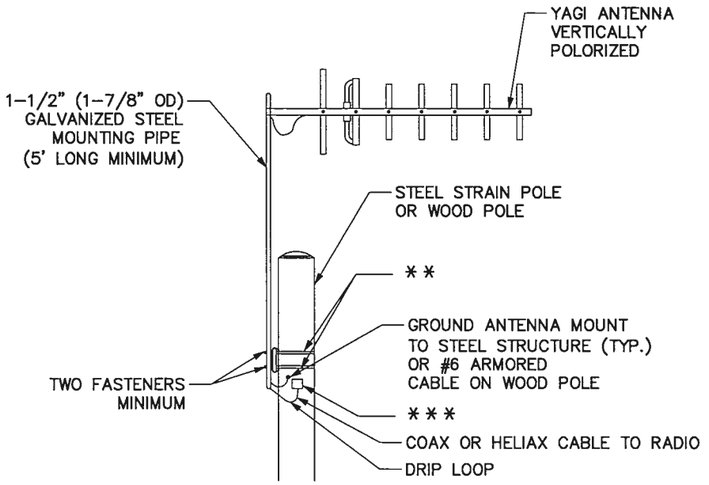
*	4.0' PIPE EXTENSION WHEN MOUNTED ON TRAFFIC SIGNAL MAST ARM OR LUMINAIRE ARM.
**	5/8" (MIN.) STAINLESS STEEL BANDING 2 PLACES MIN.
***	ENTRY INTO STEEL POLE OR CONDUIT WEATHERHEAD ON WOOD POLE



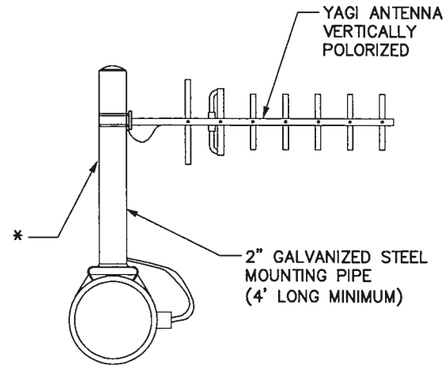
LUMINAIRE ARM MOUNT



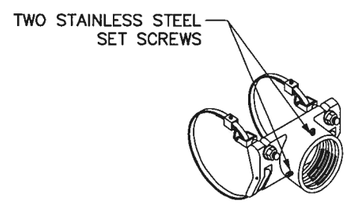
MAST ARM MOUNT



POLE MOUNT



SIDE VIEW



BAND MOUNT BRACKET DETAIL

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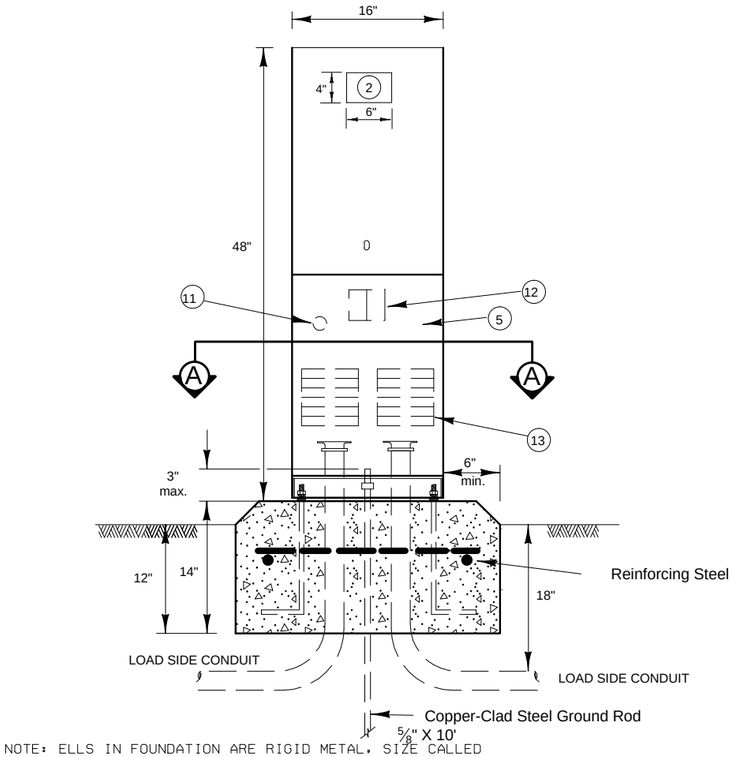
TRAFFIC SIGNAL DETAILS

ANTENNA MOUNTING DETAILS

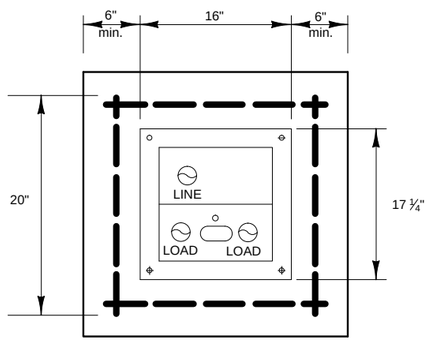
DWG. NO. 02893-13 | SHEET NO.



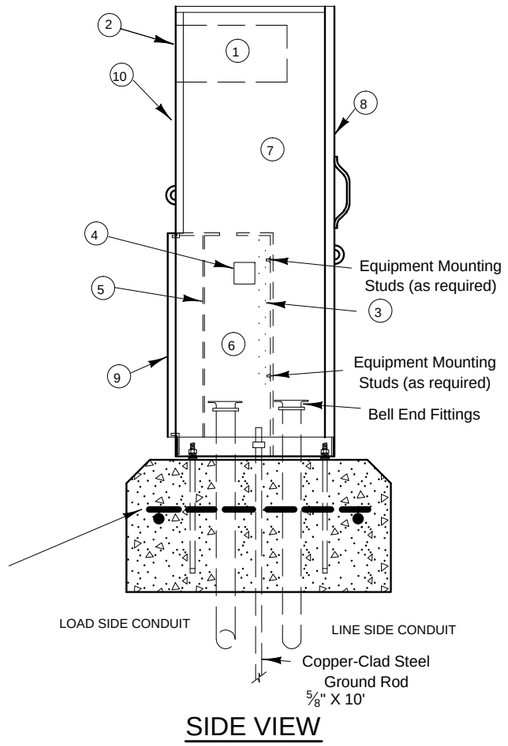
NOTE: ELLS IN FOUNDATION ARE RIGID METAL, SIZE CALLED FOR ON THE PLANS. EXTENSION CONDUITS FROM THESE ELLS MAY BE PVC, PROVIDED ENDS OF RIGID METAL CONDUITS ARE MORE THAN 2 IN. BELOW TOP OF CONCRETE FOUNDATION. WHERE EXTENSION CONDUITS ARE METAL, GROUNDING BUSHING MUST BE INSTALLED AND A BONDING JUMPER PROPERLY TERMINATED.

FRONT VIEW

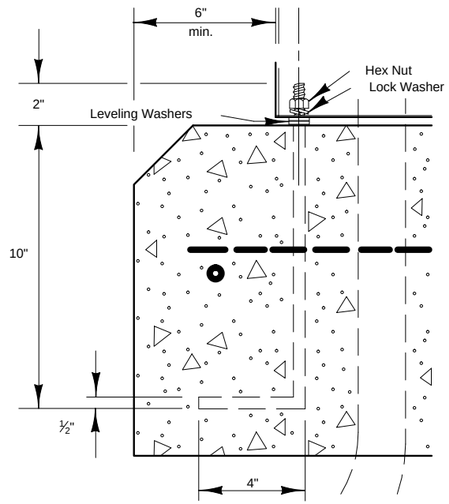
TY C SHOWN. TY A SIMILAR EXCEPT THAT TY A SHALL HAVE INDIVIDUAL CIRCUIT BREAKERS MOUNTED ON A EQUIPMENT MOUNTING PANEL. CB HANDLES SHALL PROTRUDE THROUGH HINGED DEADFRONT TRIM.



SECTION A-A



SIDE VIEW



ANCHOR BOLT DETAIL

GENERAL NOTES:

1. THE PEDESTAL SERVICE SHALL BE UL TYPE 3R, AND SHALL BE CONSTRUCTED OF A MINIMUM OF 12 GAUGE STAINLESS STEEL OR ALUMINUM AS REQUIRED. STAINLESS STEEL SHALL NOT BE PAINTED. FOR ALUMINUM, THE FINISH SHALL BE AN ELECTROSTATIC APPLIED POLY-URETHANE BAKED ON POWDER, LIGHT GREEN IN COLOR, OR COLOR AS SHOWN ELSEWHERE AND AS APPROVED BY THE ENGINEER. THE FRONT OF THE INTERIOR DEAD FRONT TRIM SHALL BE PERMANENTLY LABELED, "DANGER HIGH VOLTAGE" WITH OSHA STYLE LABEL. THE EXTERIOR OF THE PEDESTAL SERVICE DOOR SHALL BE PERMANENTLY LABELED WITH A PLACARD AS TO ITS USE (I.E. ROADWAY LIGHTING, TRAFFIC SIGNALS, ETC.). PLACARD SHALL BE NEAT AND PROFESSIONAL IN APPEARANCE. LETTERING SHALL BE 1" MINIMUM HEIGHT.
2. UTILITY ACCESS DOOR SHALL HAVE STAINLESS STEEL PIANO HINGE AND PROVISIONS FOR PADLOCKING.
3. PEDESTAL DOOR SHALL HAVE STAINLESS STEEL PIANO HINGE AND STAINLESS STEEL LATCH WITH PROVISIONS FOR PADLOCKING.
4. METER ACCESS SHALL BE HINGED AND CAPABLE OF PADLOCKING.
5. ALL MOUNTING HARDWARE AND INSTALLATION DETAILS OF SERVICES SHALL BE IN ACCORDANCE WITH UTILITY COMPANY SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE LOCAL UTILITY COMPANY AND OBTAINING THEIR APPROVAL OF PEDESTAL DETAILS PRIOR TO MAKING SUBMITTAL TO THE CITY AND PRIOR TO CONSTRUCTING THE ELECTRICAL PEDESTAL SERVICE. ANY CHANGES REQUIRED BY THE UTILITY COMPANY SHALL BE NOTED ON THE SUBMITTALS.
6. METER SOCKET SHALL BE A MINIMUM OF 100 AMP RATING AND SHALL COMPLY WITH THE LOCAL UTILITY REQUIREMENTS.
7. PHOTOELECTRIC CONTROL SHALL MEET THE REQUIREMENTS AS SHOWN ON ED(5). SHIELD TO CONTROL STRAY LIGHT IS ALLOWABLE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER OPERATION OF THE PHOTO-ELECTRIC CONTROL. THE CONTRACTOR SHALL MOVE AND/OR ADJUST OR SHIELD THE PHOTOCELL FROM STRAY OR AMBIENT NIGHTTIME LIGHT OR SHALL MAKE ANY OTHER ADJUSTMENTS REQUIRED FOR PROPER OPERATION. THE PHOTOCELL SHALL FACE NORTH WHEN PRACTICABLE. UNLESS OTHERWISE SHOWN ON THE PLANS, THE PHOTOCELL SHALL TURN ON THE ILLUMINATION SYSTEM AT 1.0 +(-) 0.5 FOOTCANDLE AND TURN OFF THE ILLUMINATION SYSTEM AT TWO FOOTCANDLES HIGHER THAN TURN ON.
8. THE CONTROL STATION (H-O-A SWITCH) SHALL BE AS SHOWN ON TxDOT STANDARD ED(5) EXCEPT THAT H-O-A SWITCH OPERATING HANDLE SHALL PROTRUDE THROUGH HINGED DEADFRONT TRIM AND NEMA 1 ENCLOSURE WILL NOT BE REQUIRED.
9. CONCRETE FOR PEDESTAL SERVICE FOUNDATION SHALL BE CLASS A OR C , AND SHALL BE IN ACCORDANCE WITH TxDOT ITEM 420, "CONCRETE STRUCTURES", EXCEPT THAT CONCRETE WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE CONSIDERED INCIDENTAL.
10. REINFORCING STEEL SHALL BE #4 REBAR IN ACCORDANCE WITH TxDOT ITEM 440, "REINFORCING STEEL".
11. ANCHOR BOLTS SHALL BE A36M55 IN ACCORDANCE WITH ITEM 449, "ANCHOR BOLTS". ANCHOR BOLTS SHALL BE ½ INCH X 12 INCHES X 4 INCHES (DIA. X LENGTH X HOOK LENGTH).
12. ALL CONDUIT AND CONDUCTORS ATTACHED TO THE PEDESTAL SERVICE AND WITHIN 12 INCHES OF THE PEDESTAL SERVICE WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE SUBSIDIARY TO THE PEDESTAL SERVICE. ALL SERVICE CONDUIT AND CONDUCTORS FROM THE UTILITY COMPANY TRANSFORMER TO A POINT 12 INCHES FROM THE THE PEDESTAL SERVICE SHALL BE PAID FOR SEPARATELY. SERVICE CONDUIT SHALL BE THE SIZE AND TYPE AS SHOWN IN THE ELECTRICAL SERVICE DATA.
13. DIMENSIONS MAY VARY TO ACCOMODATE REQUIRED EQUIPMENT, UTILITY COMPANY REQUIREMENTS, OR MANUFACTURER'S STANDARD EQUIPMENT DIMENSIONS. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR APPROVAL, SIX (6) COPIES OF BROCHURES AND/OR DRAWINGS OF THE PEDESTAL SERVICE TO BE SUPPLIED, INCLUDING ACTUAL DIMENSIONS, AND A PAINT COLOR SAMPLE.
14. A SEPARATE ENCLOSURE AS SHOWN ON TxDOT STANDARD ED(4) OR ED(5) FOR PHOTOCELL SHALL NOT BE USED FOR PEDESTAL SERVICES. PHOTOCELL SHALL BE INSTALLED AS SHOWN HERE.
15. THE PEDESTAL DOOR SHALL HAVE A MECHANICALLY ATTACHED DATA POCKET ON THE INSIDE. POCKET SHALL BE EITHER METAL OR THEMOPLASTIC AND SHALL MEASURE AT LEAST 12 INCHES BY 12 INCHES. THE CONTRACTOR SHALL PREPARE AND SUBMIT A SCHEMATIC DRAWING UNIQUE TO AN INDIVIDUAL SERVICE. THE APPROVED DRAWING SHALL BE LAMINATED AND PLACED INTHE DOCUMENT POCKET OF THE SERVICE AT THE TIME OF SHIPMENT TO THE JOB SITE. ALL APPLICABLE WIRING DIAGRAMS AND PLAN SHEET LAYOUTS FOR ALL EQUIPMENT AND BRANCH BREAKER CIRCUITS SUPPLIED BY THAT SERVICE SHALL ALSO BE LAMINATED AND PLACED IN THE DOCUMENT POCKET PRIOR TO SHIPPING.
16. GROUND ROD CLAMP TO BE UL LISTED FOR DIRECT BURIAL. ALL NON-CONDUCTIVE COATING TO BE REMOVED FROM GROUND ROD WIRE TO BE #6 AWG SOLID COPPER. METAL CONDUIT ELLS TO HAVE GROUNDING BUSHING AND BONDING JUMPERS CORRECTLY INSTALLED.
17. ALL CONDUITS ENTERING ENCLOSURES FROM UNDERGROUND MUST BE SEALED. SILICONE SHALL NOT BE ALLOWED.
18. ALL CONDUCTORS SHALL BE MEGGED AND PULL TESTED. TRAFFIC SIGNAL CABLE NOT TO BE MEGGED AFTER CONNECTION, AS ELECTRONICS WILL BE DAMAGED.
19. TOP OF CONCRETE FOUNDATION TO BE FINISHED IN A NEAT AND WORKMAN LIKE MANNER. IF LEVELING WASHERS ARE USED, NO MORE THAN ⅛ IN. HEIGHT SHALL BE USED AT ANY ONE CORNER. MAXIMUM DIP OR RISE IN FOUNDATION IS NOT TO EXCEED ⅛ IN PER FOOT. WHEN PROPERLY INSTALLED, TOP OF SERVICE ENCLOSURE SHALL READ LEVEL FRONT TO BACK AND SIDE TO SIDE WITHIN ¼ IN. ROCKING OR MOVEMENT OF THE SERVICE ENCLOSURE SHALL BE PREPARED BY THE CONTRACTOR AT NO COST TO THE STATE.
20. LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL NOT BE ALLOWED ON PS TYPE SERVICES.

LEGEND

1. METER SOCKET, (when required)
2. METER SOCKET 4" x 6" Plexiglas window installed in the lid.
3. EQUIPMENT MOUNTING PANEL
4. PHOTO ELECTRIC CONTROL WINDOW, (when required)
5. HINGED DEADFRONT TRIM
6. LOAD SIDE CONDUIT AREA
7. LINE SIDE CONDUIT AREA
8. UTILITY ACCESS DOOR, with handle
9. PEDESTAL DOOR
10. HINGED METER ACCESS
11. CONTROL STATION (H-O-A Switch)
12. MAIN DISCONNECT
13. BRANCH CIRCUIT BREAKERS

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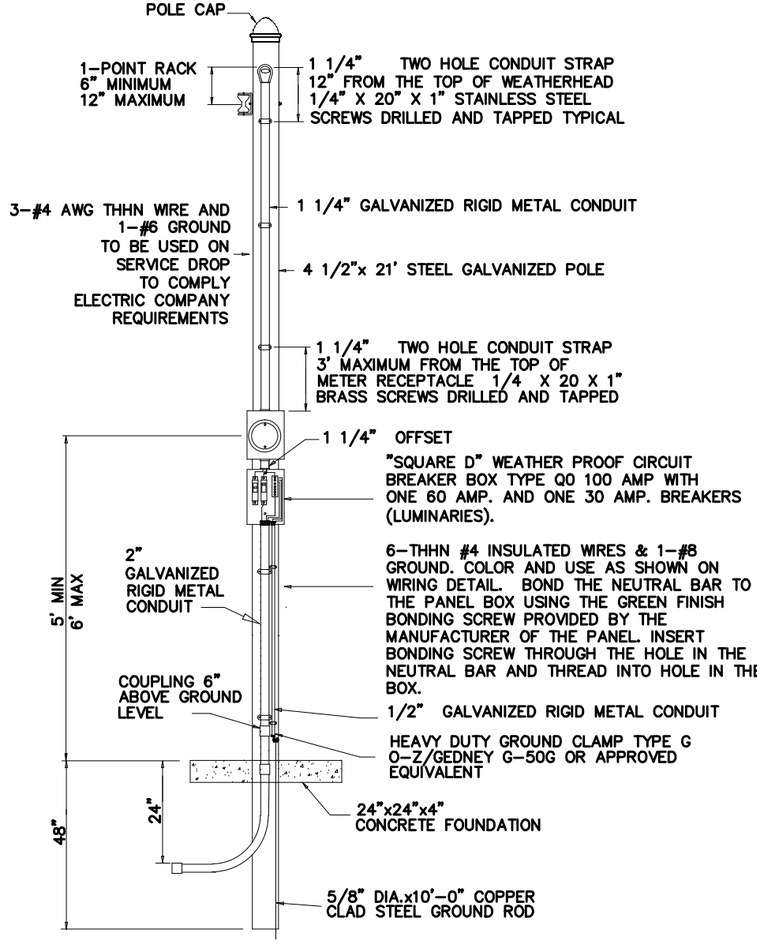
$FILEABBREV$

TRAFFIC SIGNAL DETAILS

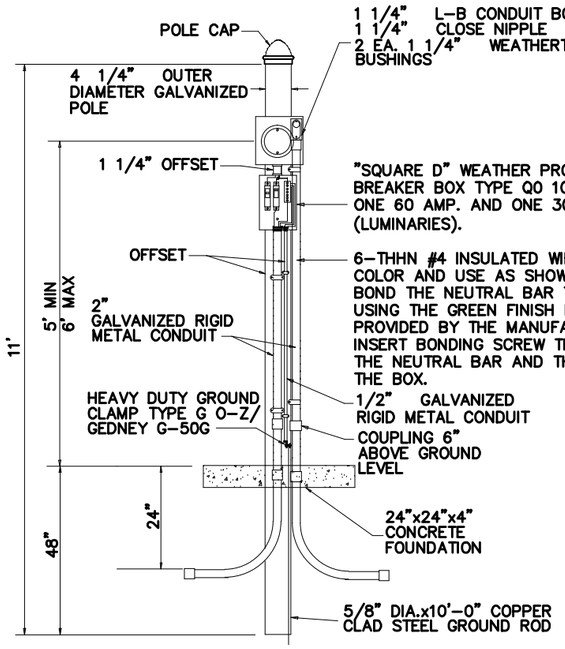
ELECTRICAL SERVICE SUPPORT PEDESTAL SERVICE TYPE PS

DWG. NO. 02893-14 | SHEET NO.



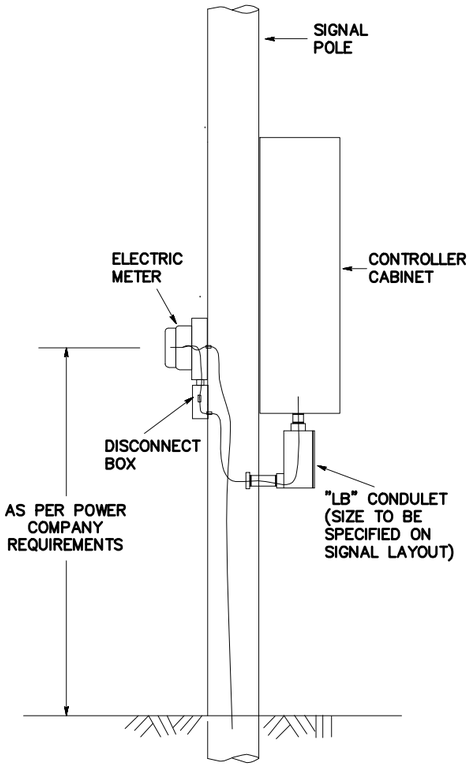
METER POLE ASSEMBLY (AERIAL SERVICE)

NOT TO SCALE



METER POLE ASSEMBLY (UNDERGROUND SERVICE)

NOT TO SCALE



POLE MOUNTED CONTROLLER & ELECTRIC METER DETAIL

NOTES:

1. CLEARANCE FOR SERVICE ENTRANCE AND DROP CONDUCTORS 12 FT. ABOVE FINSHED GRADE, SIDEWALKS, RESIDENTAL DRIVEWAYS OR AREAS WHERE TRUCK TRAFFIC IS NOT ENCOUNTERED TRUCKS SHALL BE DEFINED AS ANY VEHICLE EXCEEDING 8 FT IN HEIGHT.
2. 18 FT. OVER NON-RESIDENTAL DRIVEWAYS, PARKING LOTS, ALLEYS AND OTHER AREAS SUBJECT TO TRUCK TRAFFIC 22 FT. OVER PUBLIC STREETS AND ROADS.

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1	02/12	POWER WIRING MODIFICATIONS.	TOD		

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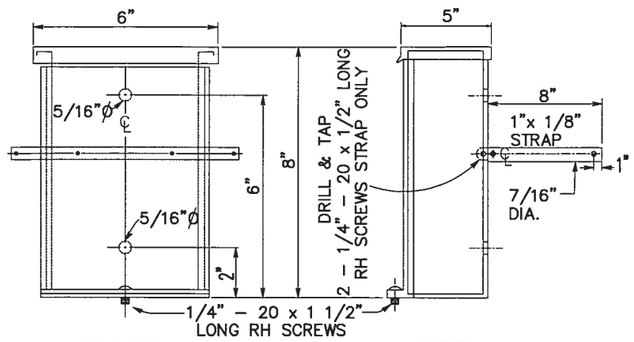
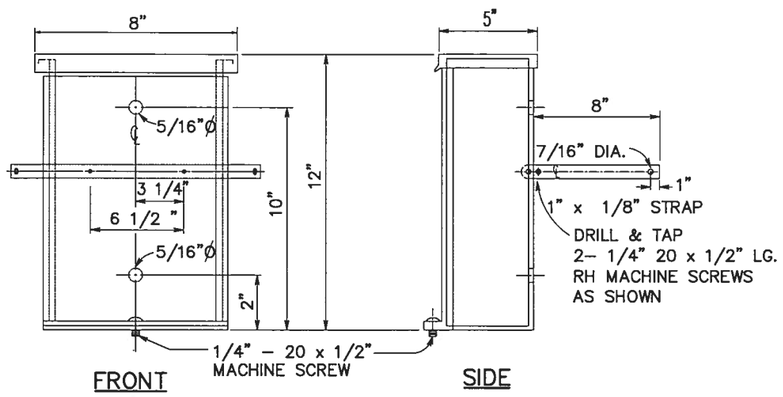
TRAFFIC SIGNAL DETAILS

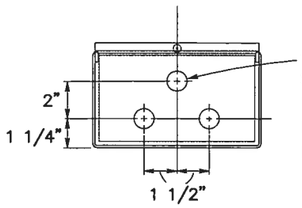
METER LOOP

DWG. NO. 02893-15

SHEET NO.







THREE (3) – 1 3/8" KNOCK OUTS
SPACED AS SHOWN
(FOR 1" CONDUIT)

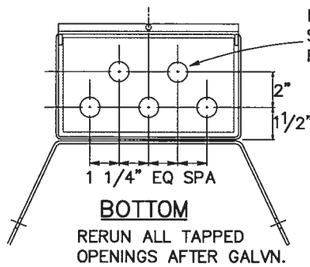
MATERIAL: 12 GA. SHEET STEEL

FASTENINGS: TO BE NON–FERROUS MATL.

FINISH: COMPLETE BOX SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION, PER ASTM 123–68 OR LATEST REVISION WITH 2 oz. PER SQ. FT. OF COATED AREA. RERUN ALL TAPPED OPENINGS.

RAINTIGHT JUNCTION BOX

8" X 6" X 5" O.A. DIM.
3 – 1 /8" BOTTOM K.O.



FIVE (5) – 1/8" KNOCK OUT
SPACED AS SHOWN
FOR 1" RIGID CONDUIT

MATERIAL: 12 GA. SHEET STEEL

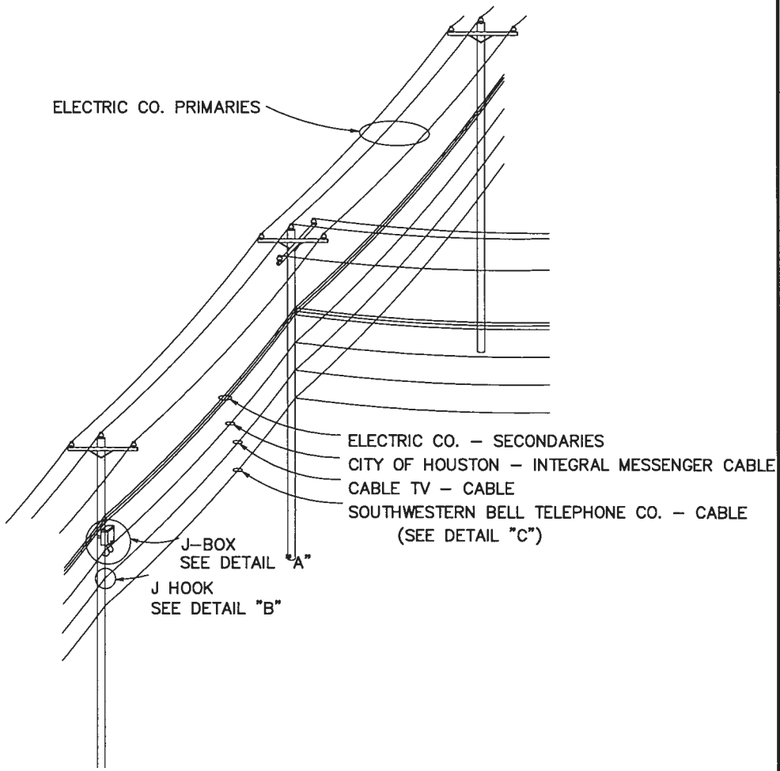
FASTENINGS: TO BE NON–FERROUS MATL.

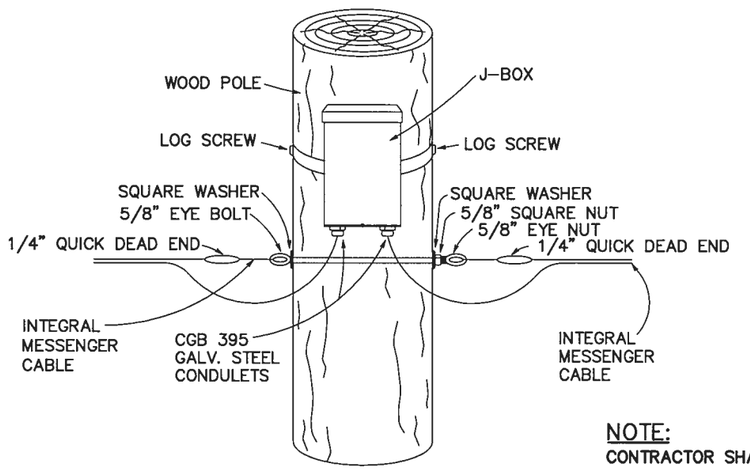
FINISH: COMPLETE BOX SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION, PER ASTM 123–68 OR LATEST REVISION WITH 2 oz. PER SQ. FT. OF COATED AREA.

RERUN ALL TAPPED
OPENINGS AFTER GALVN.

RAINTIGHT JUNCTION BOX

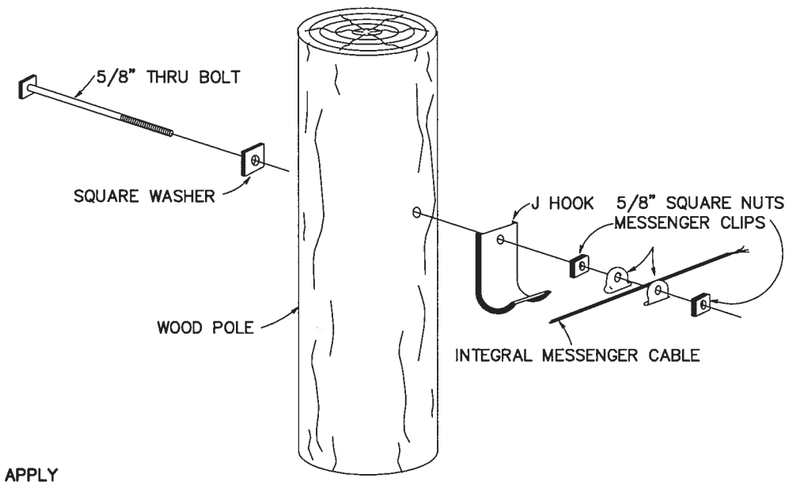
8" X 5" X 12" O.A. DIM.
5 – 1 3/8" BOTTOM K.O.



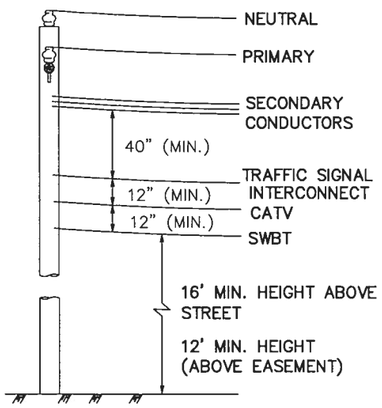


DETAIL A

NOTE:
CONTRACTOR SHALL TRIM TREES AND APPLY WOOD PRESERVATIVE AS DIRECTED BY ENGINEER AND/OR APPROVED CITY OF HOUSTON REPRESENTATIVE.



DETAIL B



DETAIL C

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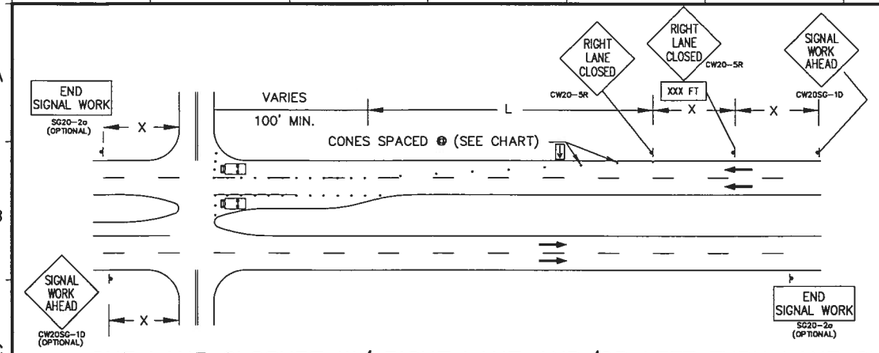
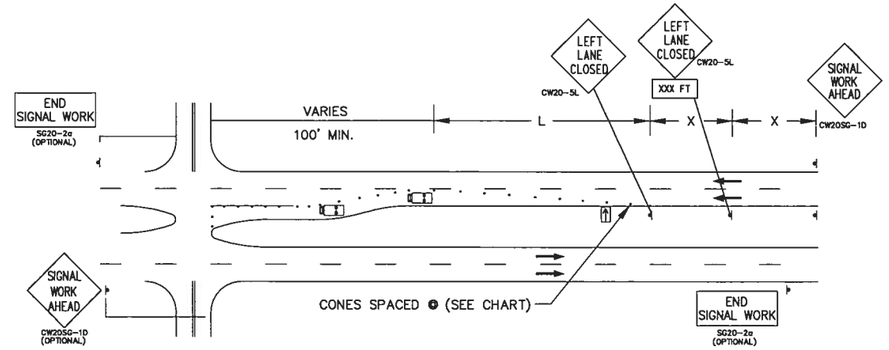
TRAFFIC SIGNAL DETAILS

HARDWIRE INTERCONNECT DETAILS

DWG. NO. 02893–16 | SHEET NO.

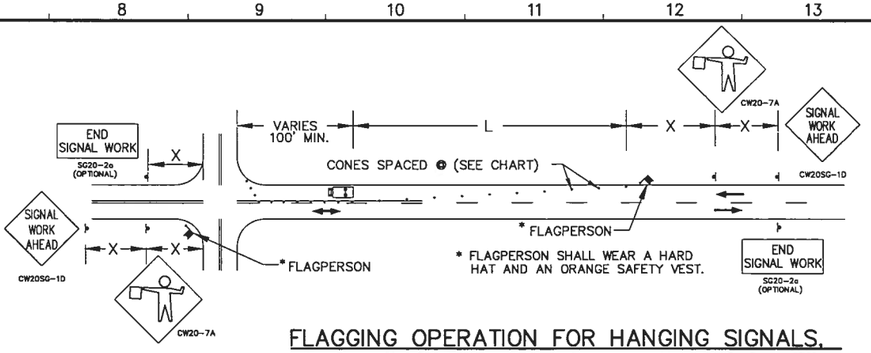


ONE LANE CLOSURE W/ RIGHT LANE AND/OR LEFT TURN LANE CLOSED

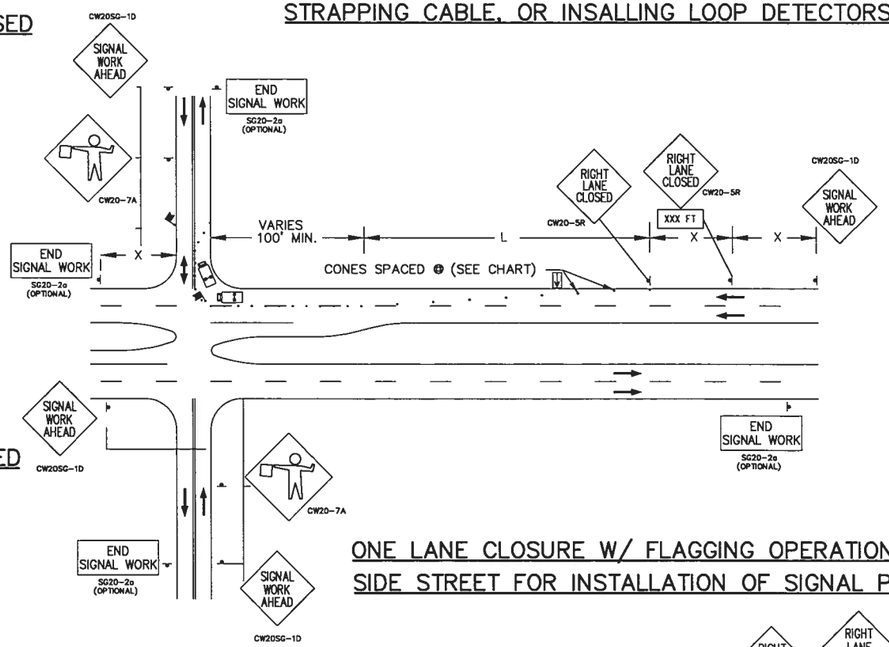


ONE LANE CLOSURE W/ LEFT LANE AND/OR LEFT TURN LANE CLOSED

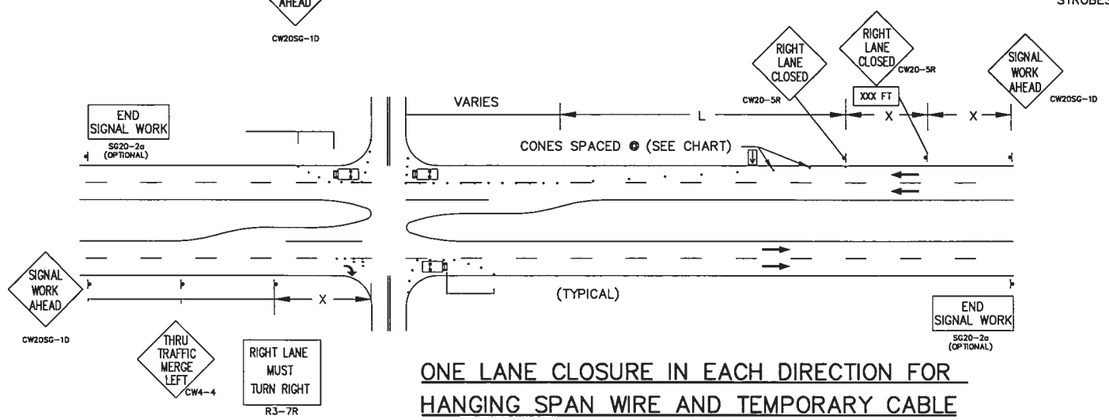
MEDIAN NOSE MODIFICATION



FLAGGING OPERATION FOR HANGING SIGNALS, STRAPPING CABLE, OR INSALLING LOOP DETECTORS



ONE LANE CLOSURE W/ FLAGGING OPERATION ON SIDE STREET FOR INSTALLATION OF SIGNAL POLES



ONE LANE CLOSURE IN EACH DIRECTION FOR HANGING SPAN WIRE AND TEMPORARY CABLE

TYPICAL TRANSITION LENGTHS
SUGGESTED MAXIMUM SPACING OF DEVICES

POSTED SPEED	FORMULA	MINIMUM DESIRABLE TAPER LENGTHS ** 10' OFFSET	11' OFFSET	12' OFFSET	SUGGESTED MAXIMUM SPACING OF DEVICE ON A TAPER	ON A TANGENT	MINIMUM SIGN SPACING X DISTANCE
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'
35		205'	225'	245'	35'	70'-90'	160'
40		265'	295'	320'	40'	80'-100'	240'
45	L=WS	450'	495'	540'	45'	90'-110'	320'
50		500'	550'	600'	50'	100'-125'	400'
55		550'	605'	660'	55'	110'-140'	500'
60		600'	660'	720'	60'	120'-150'	600'

** TAPER LENGTHS HAVE BEEN ROUNDED OFF

L=LENGTH OF TAPER (FT.)
W=WIDTH OF OFFSET (FT.)
S=POSTED SPEED(MPH)

LEGEND

HEAVY WORK VEHICLE

FLASHING ARROW PANEL

NOTES:

1. ALL TRAFFIC CONTROL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST REVISION.
2. THE MINIMUM LANE WIDTH ALLOWED IS 10 FEET. THE MINIMUM BUFFER ZONE BETWEEN THE WORK ZONE AN ADJACENT TRAFFIC IS 2 FEET.
3. FLORESCENT ORANGE SHALL BE THE BACK GROUND COLOR ON ALL WORK ZONE SIGNS.
4. THE CONTRACTOR SHALL REMOVE ADVANCE SIGNS WHEN NO CONSTRUCTION OPERATIONS ARE UNDERWAY.
5. OBSTRUCTIONS OR HAZARDS AT THE WORK AREA SHALL BE CLEARLY MARKED AND DELINEATED AT ALL TIMES.
6. ALL HOLES, TRENCHES OR OTHER HAZARDOUS AREAS SHALL BE ADEQUATELY PROTECTED BY LIGHTS OR OTHER PROTECTIVE DEVICES.
7. TRENCHES SHALL BE COVERED OR SURROUNDED WITH ORANGE PLASTIC CONSTRUCTION FENCE AS DIRECTED BY THE ENGINEER.
8. FLAGGER AND FCW20-7a SIGN MAY BE REQUIRED ACCORDING TO FIELD CONDITIONS.
9. VEHICLES PARKED IN ROADWAY SHALL BE EQUIPPED WITH TWO STROBES.

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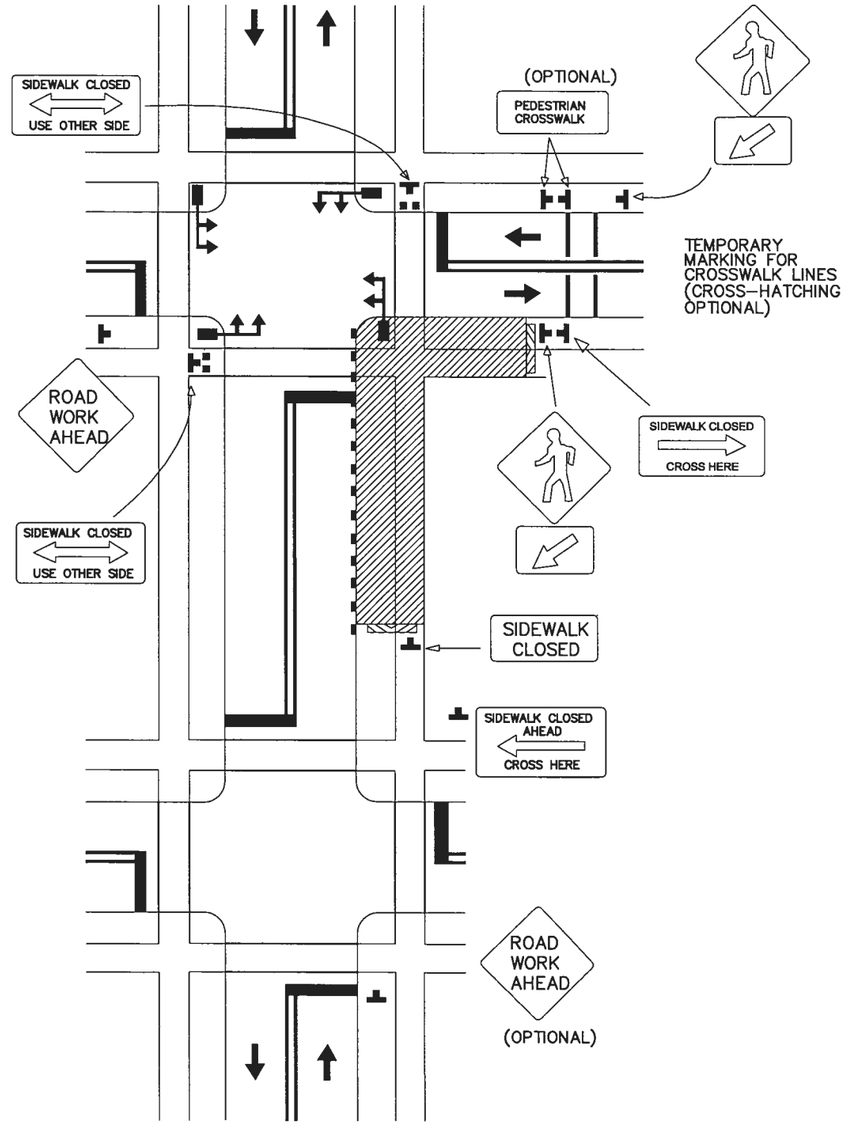
TRAFFIC SIGNAL DETAILS

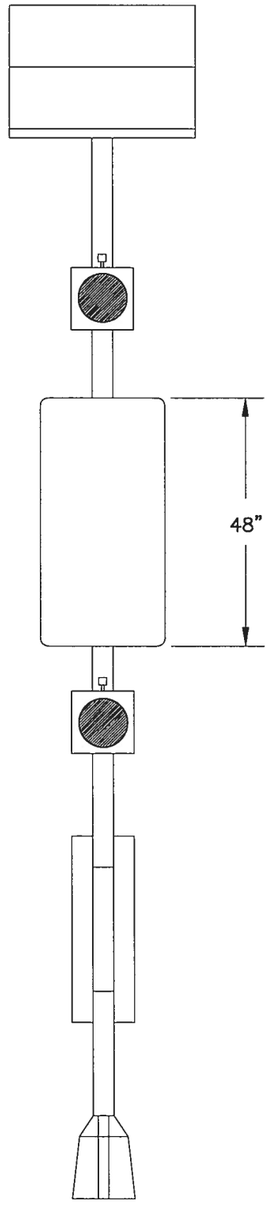
TRAFFIC CONTROL PLAN FOR SIGNAL CONSTRUCTION

DWG. NO. 02893-17 | SHEET NO.

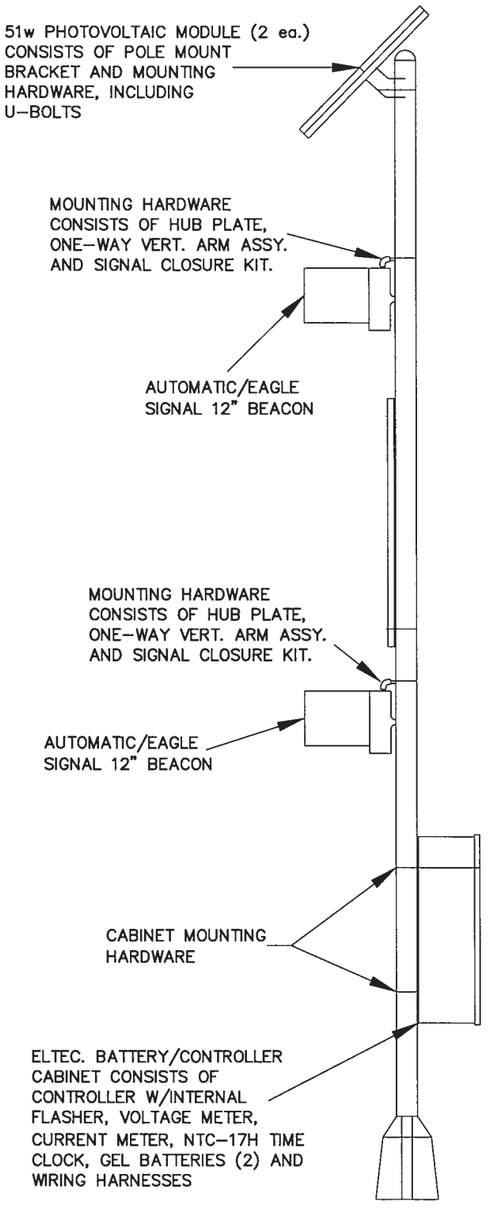
CROSSWALK CLOSURES AND PEDESTRIAN DETOURS



SOLAR SCHOOL ZONE FLASHING BEACON



FRONT VIEW



SIDE VIEW

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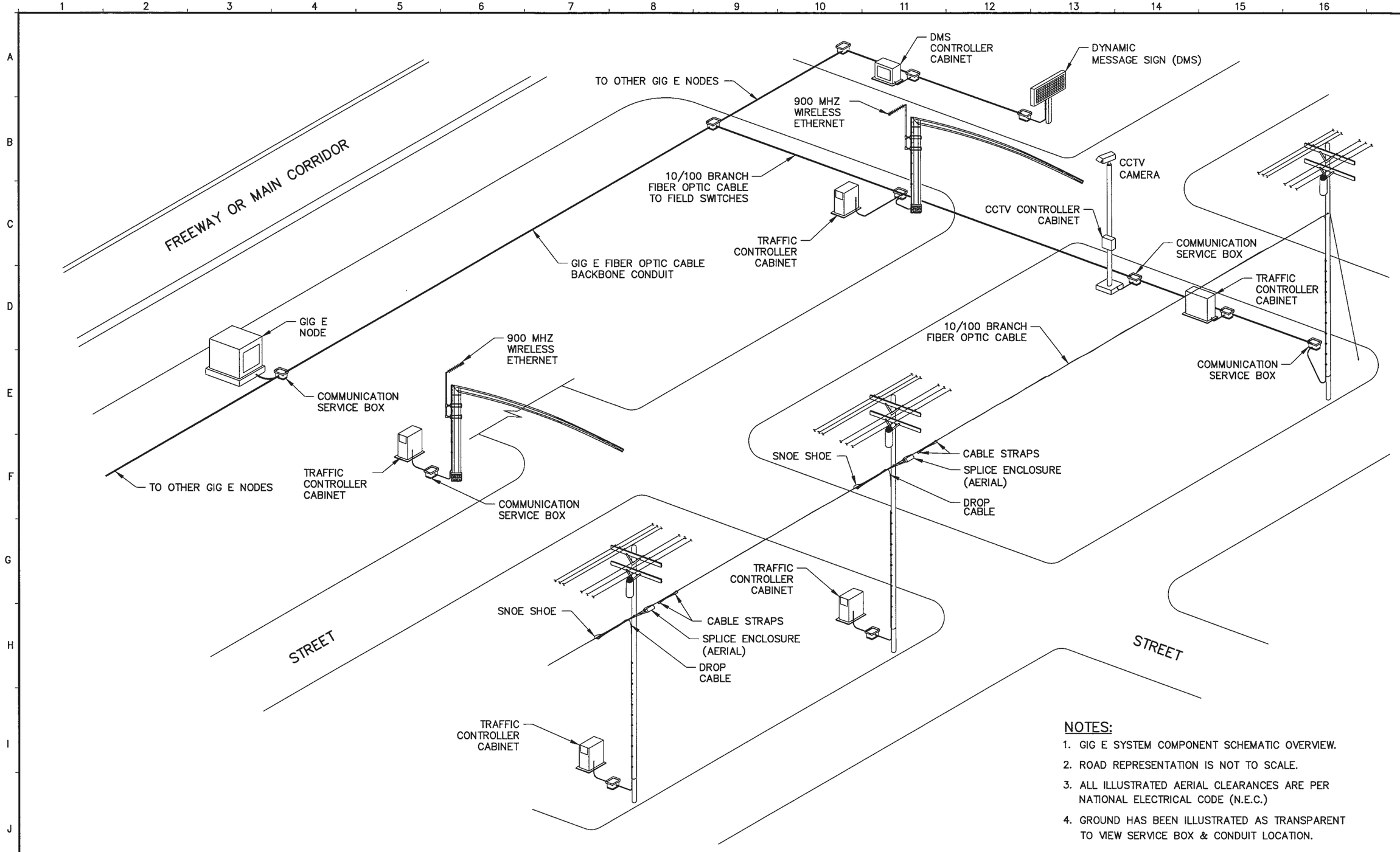
TRAFFIC SIGNAL DETAILS

CROSSWALK CLOSURES AND PEDESTRIAN DETOURS, SOLAR SCHOOL ZONE FLASHING BEACON

DWG. NO. 02893–18

SHEET NO.



NOTES:

1. GIG E SYSTEM COMPONENT SCHEMATIC OVERVIEW.
2. ROAD REPRESENTATION IS NOT TO SCALE.
3. ALL ILLUSTRATED AERIAL CLEARANCES ARE PER NATIONAL ELECTRICAL CODE (N.E.C.)
4. GROUND HAS BEEN ILLUSTRATED AS TRANSPARENT TO VIEW SERVICE BOX & CONDUIT LOCATION.

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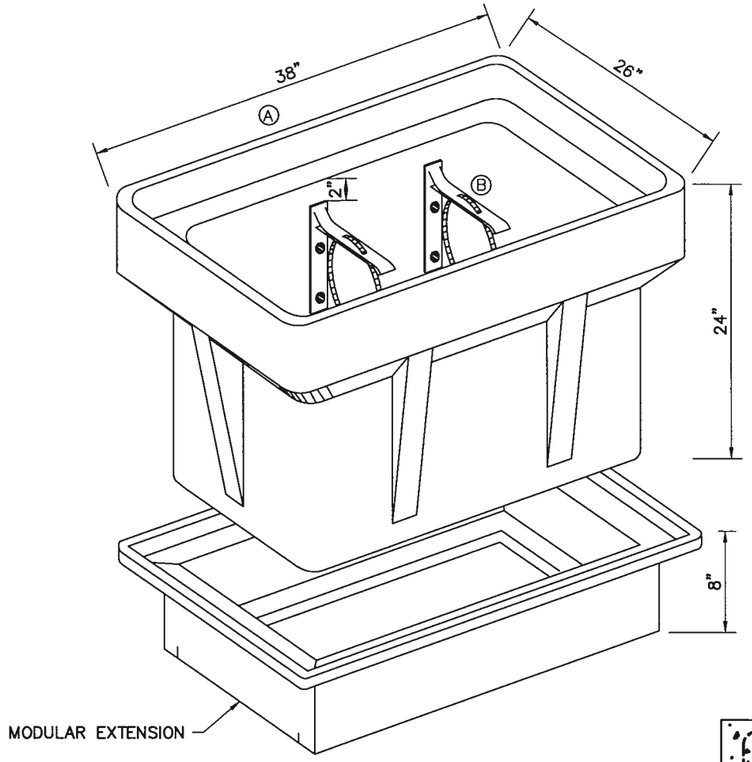
COMMUNICATION DETAILS

COMMUNICATIONS OVERVIEW

DWG. NO. 02893-19

SHEET NO.



LEGEND

Ⓐ SPLICE CLOSURE BRACKET PROVIDES MINIMUM LID CLEARANCE OF 2" AND SUPPORTS FIBER OPTIC SPLICE CLOSURE (8" DIA. X 24" LONG AT 18 LBS).

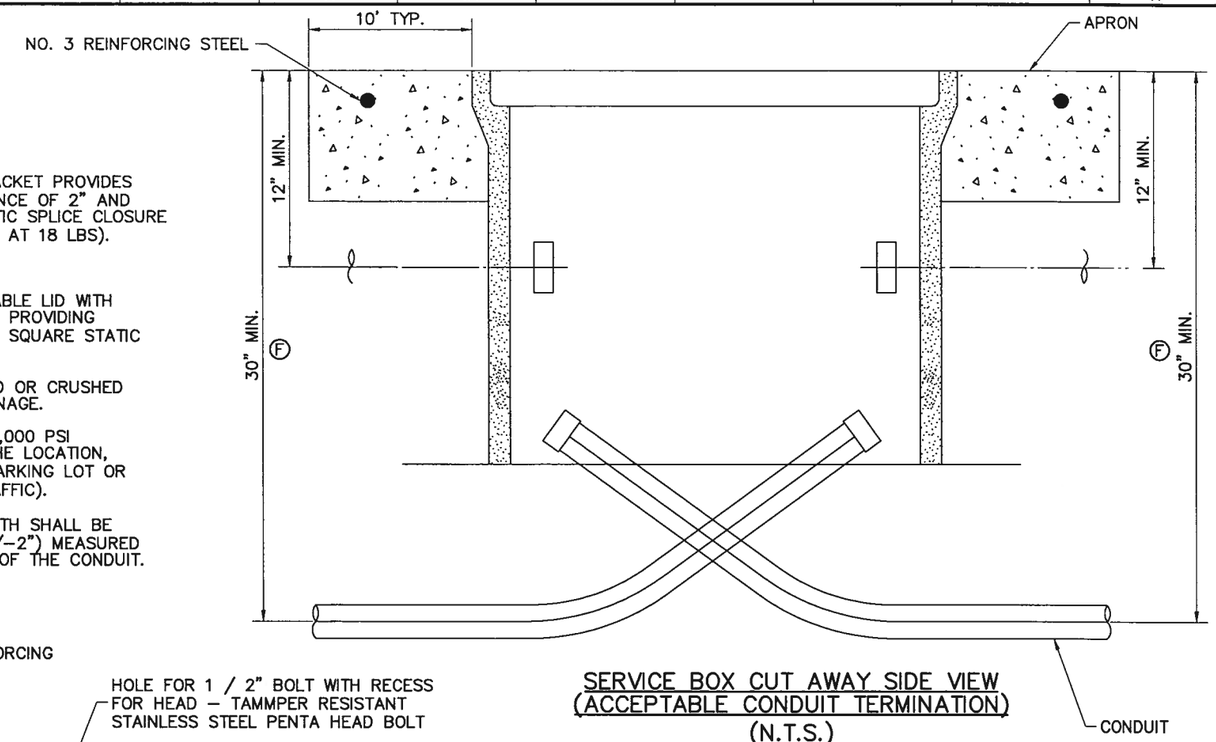
Ⓑ NYLON TIES

Ⓒ HEAVY DUTY REMOVABLE LID WITH LOCKING PROVISIONS, PROVIDING 15,000 LB. OVER 10" SQUARE STATIC LOAD SUPPORT.

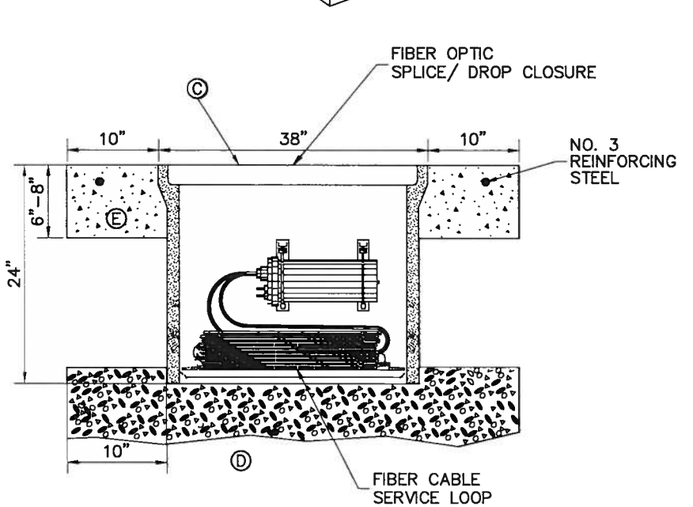
Ⓓ 6" TO 8" OF GROUND OR CRUSHED ROCK BED FOR DRAINAGE.

Ⓔ CONCRETE APRON; 3,000 PSI AS REQUIRED FOR THE LOCATION, (DRIVE, SIDEWALK, PARKING LOT OR AREAS OF LIGHT TRAFFIC).

Ⓕ CONDUIT BURIAL DEPTH SHALL BE 30" MIN. OR 12" (+/–2") MEASURED TO THE CENTERLINE OF THE CONDUIT.



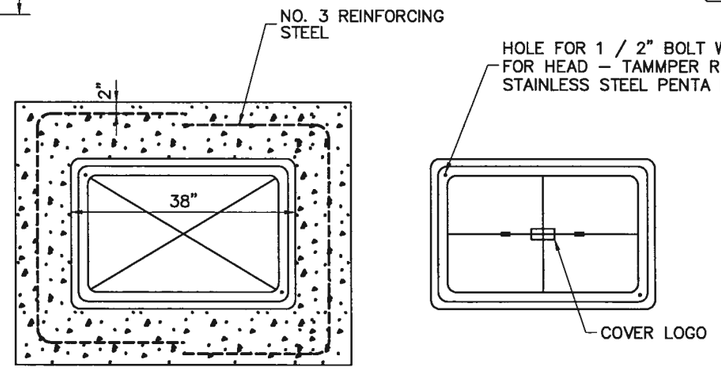
SERVICE BOX CUT AWAY SIDE VIEW
(ACCEPTABLE CONDUIT TERMINATION)
(N.T.S.)



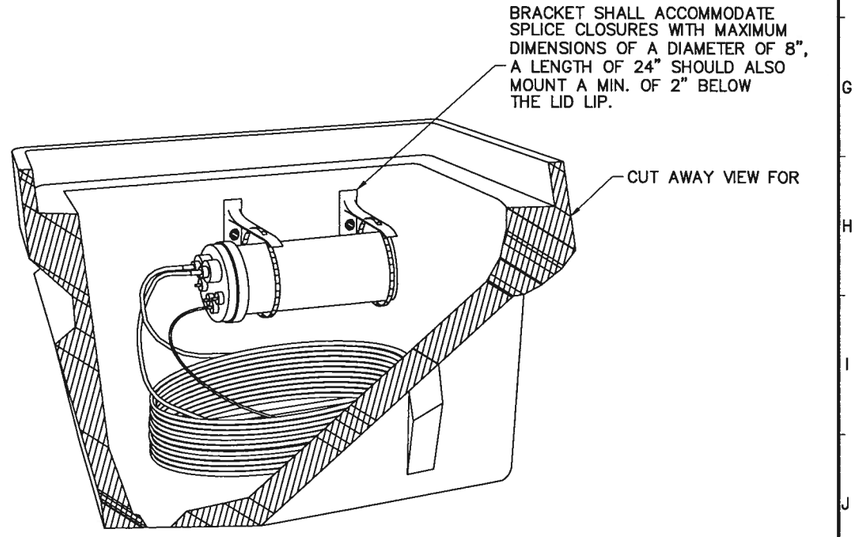
INSTALLED COMMUNICATION SERVICE BOX DETAIL
(N.T.S.)

NOTE:

CROSS SECTION VIEW OF BOX IN ORDER TO VIEW DROP CLOSURE AND CABLE CONTAINED WITHIN.



COMMUNICATION SERVICE BOX DETAIL
TOP VIEW
(N.T.S.)



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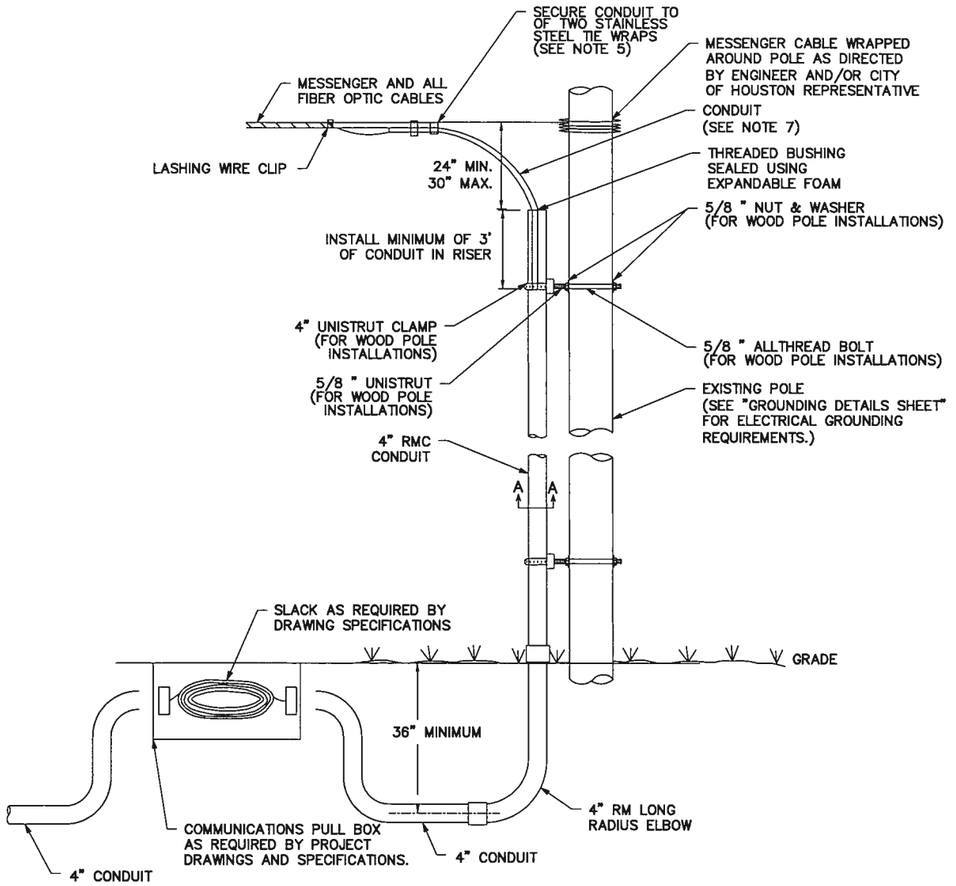
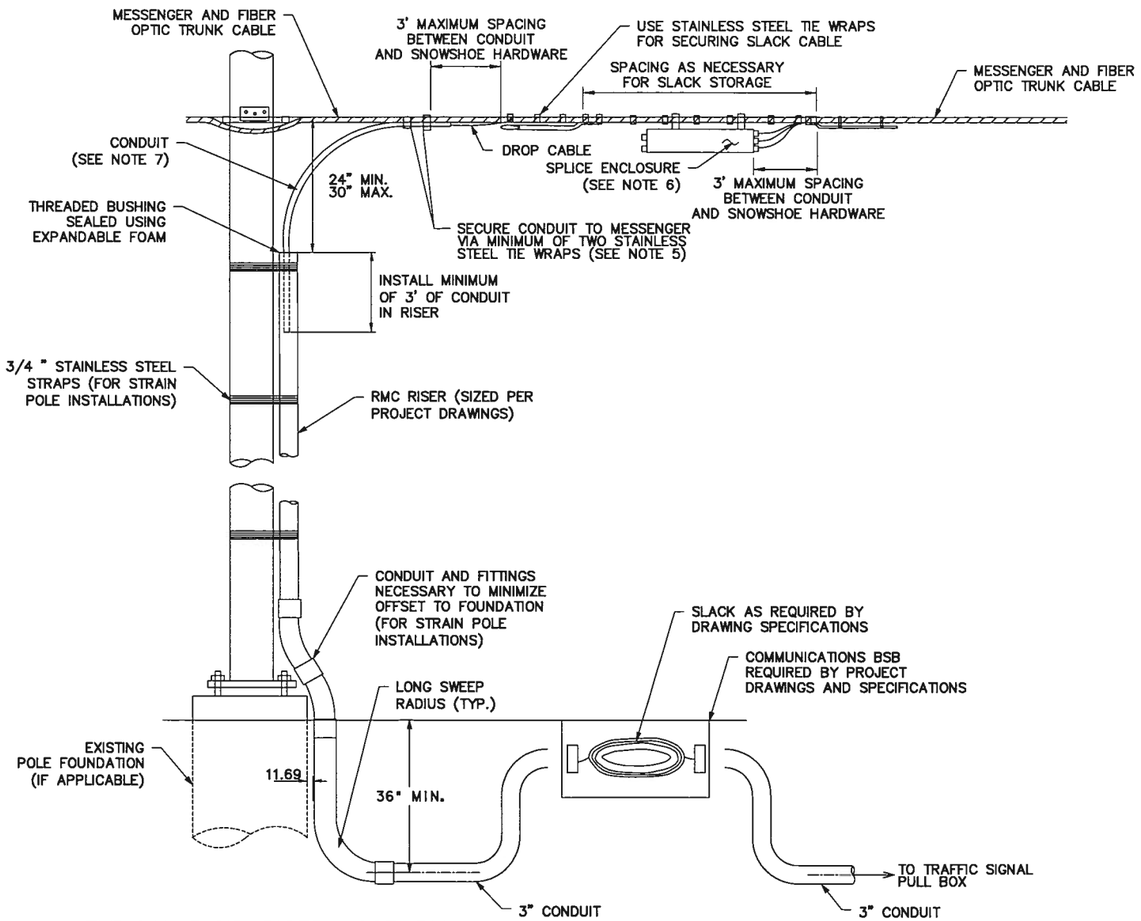
COMMUNICATION DETAILS

COMMUNICATIONS SERVICE BOX DETAILS

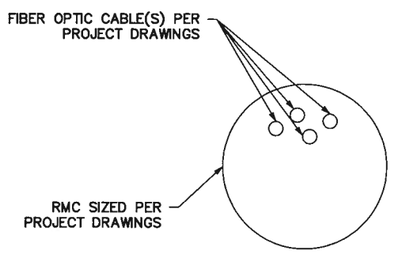
DWG. NO. 02893–20 | SHEET NO.



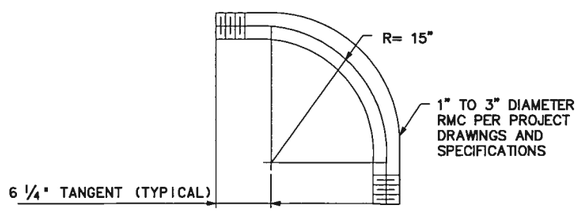
TYPICAL RIGID RISER ASSEMBLY
FOR TRUNK FIBER
AERIAL TO UNDERGROUND TRANSITIONS



TYPICAL RIGID RISER ASSEMBLY
FOR FIBER OPTIC DROP CABLE INSTALLATION



SECTION A–A



LONG RADIUS ELBOW DETAIL

NOTES:

1. THIS DETAIL SHALL BE UTILIZED WHERE APPLICABLE FOR ALL AERIAL SLACK STORAGE, AERIAL TO UNDERGROUND TRUNK CABLE TRANSITIONS, AND AERIAL SPLICING ACTIVITIES FOR TRUNK AND DROP CABLE INSTALLATIONS.
2. CABLE STORAGE AND MANAGEMENT WITHIN FIELD CABINETS SHALL BE PERFORMED BY SECURING FIBER OPTIC CABLE SLACK AND CONNECTORS IN THE TOP OF THE CABINENTS.
3. MINIMUM BEND RADII FOR ALL CONDUIT AND CONDUIT FITTINGS SHALL CONFORM TO THE REQUIREMENTS ESTABLISHED IN THE "LONG RADIUS ELBOW DETAIL" DRAWING.
4. SLACK CABLE STORAGE REQUIREMENTS SHALL BE IN ACCORDANCE WITH PROJECT DRAWINGS AND SPECIFICATIONS. SNOWSHOE HARDWARE UTILIZED SHALL BE MOORE OPTIRACK PART# MFSR24–HCK OR APPROVED EQUAL.
5. ALL TRUNK CABLE NOT DESIGNATED FOR SLACK STORAGE OR SPLICING ACTIVITIES SHALL BE OVERLASHED TO THE MESSENGER CABLE. ALL OTHER CABLE SHALL BE ATTACHED AERIALLY USING STAINLESS STEEL TIE WRAPS (PANDUIT PART# MLT 4H–LP OR APPROVED EQUAL).
6. SPLICE ENCLOSURES USED SHALL BE PART# 3M 2178 LS, L,OR LL AS NECESSARY TO ACCOMMODATE CABLES TO BE SPLICED. ALL CABLES SHALL ENTER THE ENCLOSURE FROM THE SAME END AND SHALL BE SPLICED IN BUTT CONFIGURATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER AND/OR THE APPROVED CITY OF HOUSTON REPRESENTATIVE.
7. TWO CONDUITS MAY BE REQUIRED BY THE PROJECT DRAWINGS.
8. NO SPLICE CLOSURES OR SLACK STORAGE SHALL BE LOCATED OVER PUBLIC OR PRIVATE TRAVEL WAYS.
9. ALL REQUIRED HARDWARE AND CONDUIT SHALL BE GALVANIZED.

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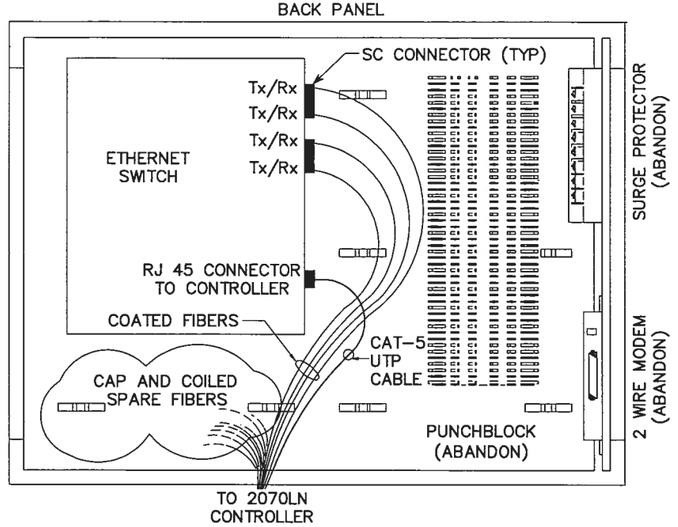
...\2009 standards\02893–21.dgn

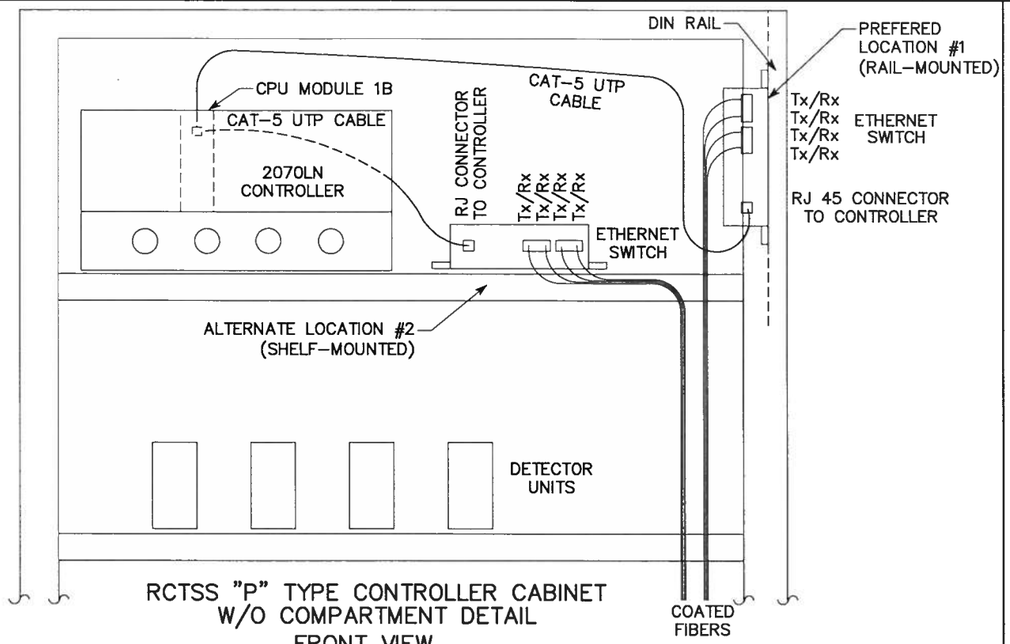
COMMUNICATION DETAILS

TRUNK FIBER AERIAL TO UNDERGROUND TRANSITIONS

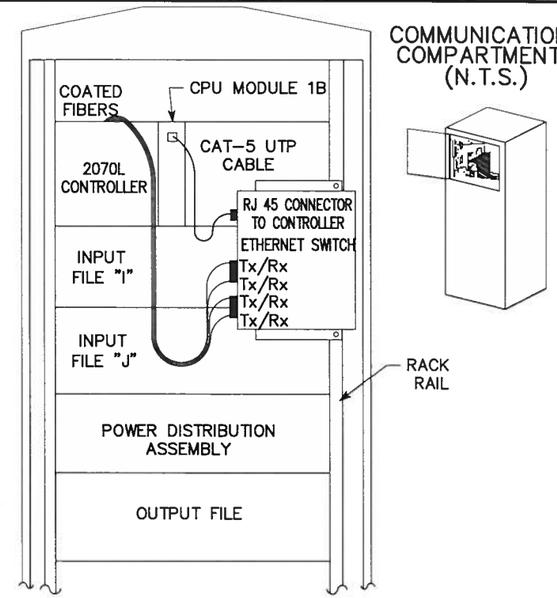
DWG. NO. 02893–21 | SHEET NO.



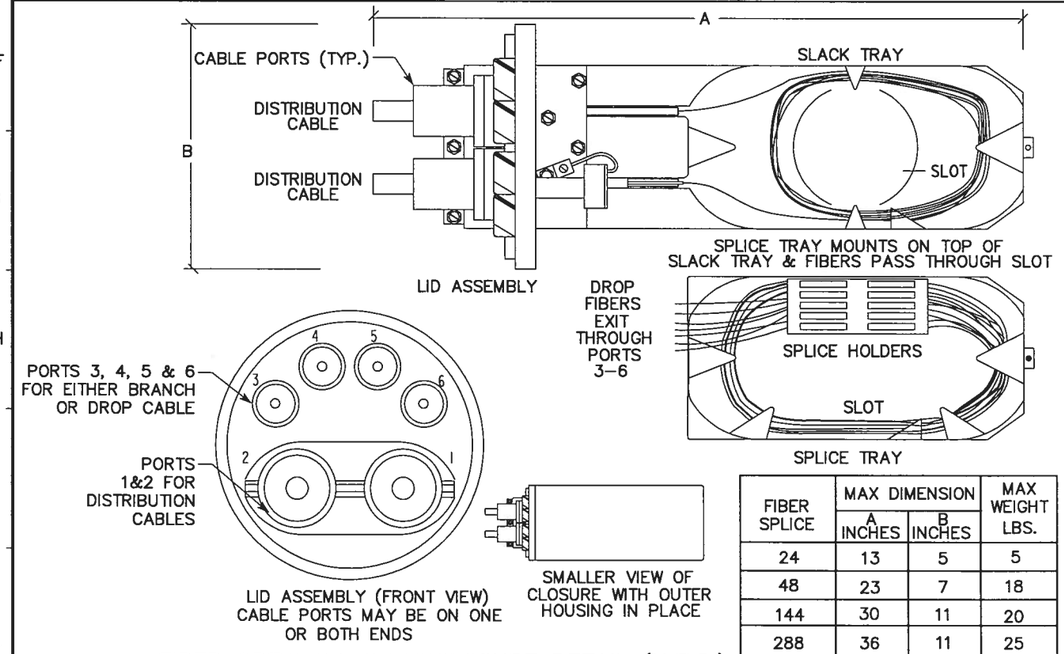
RCTSS CONTROLLER CABINET
COMMUNICATION COMPARTMENT DETAIL
(N.T.S.)



RCTSS "P" TYPE CONTROLLER CABINET
W/O COMPARTMENT DETAIL
FRONT VIEW
(N.T.S.)



TYPE 332 CONTROLLER
CABINET DETAIL
BACK VIEW
(N.T.S.)



FIBER OPTIC SPLICE ENCLOSURE DETAIL (N.T.S.)

FIBER SPLICE	MAX DIMENSION A INCHES	MAX DIMENSION B INCHES	MAX WEIGHT LBS.
24	13	5	5
48	23	7	18
144	30	11	20
288	36	11	25

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COMMUNICATION DETAILS

MISCELLANEOUS DETAILS

DWG. NO. 02893-22

SHEET NO.